



# United States Department of the Interior

NATIONAL PARK SERVICE  
Rocky Mountain National Park  
Estes Park, Colorado 80517

IN REPLY REFER TO:

L76

August 16, 2002

Dear Reader:

The Natural Resources Conservation Service (NRCS) maintains and operates a Snowpack Telemetry (SNOTEL) site in the Wild Basin District of Rocky Mountain National Park (RMNP) that has been in place since 1949. Known as the Copeland Lake SNOTEL, the existing site is located approximately 1,000 feet southwest of the Wild Basin Ranger Station at an elevation of 8,640 feet above sea level. The NRCS is proposing to install, operate and maintain a new SNOTEL site within RMNP approximately 1.8-miles west of the Copeland Lake SNOTEL site at an elevation of 9,520 feet. This site would collect climatological data to help improve streamflow forecasting in the St. Vrain River basin.

Two development alternatives are identified for detailed analysis plus a No Action alternative. The alternatives evaluated in the EA include:

## **Alternative 1 – No Action**

In the No Action alternative, the existing Copeland Lake SNOTEL site and equipment would remain at its present location approximately 1,000 feet southwest of the Wild Basin Ranger Station.

## **Alternative 2 – Relocate the existing SNOTEL Site (Environmentally Preferred Alternative)**

The existing equipment at the Copeland Lake SNOTEL site would be moved to a new site located about 2,000 feet west of Ouzel Falls, about 1.8 miles west of the existing site and 1000 feet higher in elevation. Alternatively, new equipment would be installed at the new site and the existing equipment at the Copeland Lake SNOTEL site would be removed from the park. Under both scenarios, the Copeland Lake SNOTEL site would be restored to natural conditions.

## **Alternative 3 – Install a new SNOTEL site and retain the Copeland Lake SNOTEL site (Preferred Alternative)**

New equipment would be installed at the new SNOTEL site located west of Ouzel Falls and the existing Copeland Lake SNOTEL site would remain. In the future, this alternative would also permit NRCS to install new equipment at the existing Copeland Lake SNOTEL site as long as there was no additional environmental impact or visual impact.

This EA addresses all of the issues and concerns that have been identified for each of the alternatives. The potential effect of each alternative on natural, cultural and socioeconomic resources is evaluated.

**Public Comments:**

We welcome your comments on this Environmental Assessment. If we receive important new information, or if significant new issues are raised during the public comment period, we will revise the Environmental Assessment. **Your comments must be received in writing by close of business on September 21, 2002.** You can submit your comments to us in several ways:

- **By mail:** Superintendent, Rocky Mountain National Park, Estes Park, Colorado 80517
- **By fax:** (970) 586-1397
- **By e-mail:** romo\_superintendent@nps.gov
- **By Express Delivery:** Superintendent, Rocky Mountain National Park, 1000 U.S. Highway 36, Estes Park, Colorado 80517
- **Hand deliver:** Rocky Mountain National Park Headquarters, 1000 Highway 36, Estes Park, Colorado or to the Kawuneeche Visitor Center, Rocky Mountain National Park, 16018 U.S. Highway 34, Grand Lake, Colorado 80447

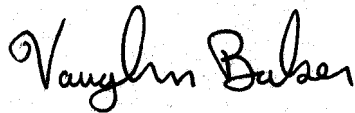
**You must include your name and mailing address with any comments you provide.** Our practice is to make comments, including names and addresses of respondents, available for public review during regular business hours. Also, we may be required to release your name and/or address if we receive a request for information that is covered by the Freedom of Information Act (5 U.S.C. 552, as amended). Individual respondents may request that we withhold their address from the record, which we will honor to the extent allowable by law. There also may be circumstances in which we would withhold from the record a respondent's identity, as allowable by law. If you wish us to withhold your name and/or address, you must state this prominently at the beginning of your comment. We will make all submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, available for public inspection in their entirety.

Additional copies of the EA are available upon request. The EA is also available on the Internet at the following address:

**<http://www.nps.gov/romo/>**

Click on "Facts/Docs" on the right side of the page. The web site has a link to the Wild Basin Snow Survey Improvement Project.

Sincerely,



Vaughn L. Baker  
Superintendent

enclosure

**ENVIRONMENTAL ASSESSMENT  
WILD BASIN SNOW SURVEY IMPROVEMENT  
PROJECT  
AUGUST 2002**



Copeland Lake SNOTEL site, Rocky Mountain National Park

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**National Park Service and the Natural Resources Conservation Service  
Rocky Mountain National Park • Colorado**

# ENVIRONMENTAL ASSESSMENT

## WILD BASIN SNOW SURVEY IMPROVEMENT PROJECT

### National Park Service and the Natural Resources Conservation Service Rocky Mountain National Park • Colorado

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**Abstract:** The Natural Resources Conservation Service (NRCS) maintains and operates a Snowpack Telemetry (SNOTEL) site in the Wild Basin District of Rocky Mountain National Park (RMNP) that has been in place since 1949. Known as the Copeland Lake SNOTEL, the existing site is located approximately 1,000 feet southwest of the Wild Basin Ranger Station at an elevation of 8,640 feet above sea level. The NRCS is proposing to install, operate and maintain a new SNOTEL site within RMNP approximately 1.8-miles west of the Copeland Lake SNOTEL site at an elevation of 9,520 feet. This site would collect climatological data to help improve streamflow forecasting in the St. Vrain River basin.

The environmental consequences of this proposed action on soils, vegetation, wildlife, threatened and endangered, sensitive and rare species, air and natural soundscape, wilderness, water, riparian areas, cultural resources, visual resources, visitor experience, the local and regional economy, prime farmland and Park operations are discussed in this EA.

#### **Public Comments:**

We welcome your comments on this Environmental Assessment. If we receive important new information, or if significant new issues are raised during the public comment period, we will revise the Environmental Assessment. **Your comments must be received in writing by close of business on September 21, 2002.** You can submit your comments to us in several ways:

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organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, available for public inspection in their entirety.

### **List of Abbreviations and Acronyms**

<b>APE</b>	Area of Potential Effect
<b>CDOW</b>	Colorado Division of Wildlife
<b>CEQ</b>	Council on Environmental Quality
<b>DBH</b>	Diameter Breast High (used to measure tree size)
<b>EA</b>	Environmental Assessment
<b>EIS</b>	Environmental Impact Statement
<b>ESA</b>	Endangered Species Act
<b>FONSI</b>	Finding of No Significant Impact
<b>NEPA</b>	National Environmental Policy Act
<b>NPS</b>	National Park Service
<b>NRCS</b>	Natural Resources Conservation Service
<b>NRHP</b>	National Register of Historic Places
<b>OAS</b>	Office of Aircraft Services
<b>RMNP</b>	Rocky Mountain National Park
<b>SNOTEL</b>	SNOWpack TELemetry

## **Summary**

The Natural Resources Conservation Service (NRCS) is proposing to install a new Snowpack Telemetry (SNOTEL) site in Rocky Mountain National Park (RMNP). The new SNOTEL site would be located in the Wild Basin District of the park approximately 2,000 feet from Ouzel Falls at an elevation of 9,520 feet above sea level. The proposed site is located in an area that has been recommended for wilderness designation since 1974.

The objectives of the proposed project are to:

- Collect climatological data and improve streamflow forecasting in the St. Vrain River Basin.
- Improve the efficiency of existing SNOTEL equipment in the St. Vrain River Basin.

Two development alternatives are identified for detailed analysis plus a No Action alternative. The alternatives evaluated in the EA include:

### **Alternative 1 – No Action**

In the No Action alternative, the existing Copeland Lake SNOTEL site and equipment would remain at its present location approximately 1,000 feet southwest of the Wild Basin Ranger Station.

### **Alternative 2 – Relocate the existing SNOTEL Site (Environmentally Preferred Alternative)**

The existing equipment at the Copeland Lake SNOTEL site would be moved to a new site located about 2,000 feet west of Ouzel Falls, about 1.8 miles west of the existing site and 1000 feet higher in elevation. Alternatively, new equipment would be installed at the new site and the existing equipment at the Copeland Lake SNOTEL site would be removed from the park. Under both scenarios, the Copeland Lake SNOTEL site would be restored to natural conditions.

### **Alternative 3 – Install a new SNOTEL site and retain the Copeland Lake SNOTEL site (Preferred Alternative)**

New equipment would be installed at the new SNOTEL site located west of Ouzel Falls and the existing Copeland Lake SNOTEL site would remain. In the future, this alternative would also permit NRCS to install new equipment at the existing Copeland Lake SNOTEL site as long as there was no additional environmental impact or visual impact.

This EA addresses all of the issues and concerns that have been identified for each of the alternatives. The potential effect of each alternative on natural, cultural and socioeconomic resources is evaluated.

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# **Chapter 1 – PURPOSE AND NEED**

Rocky Mountain National Park (RMNP) is located in north central Colorado and contains 415 square miles of spectacular scenery, recommended wilderness, and relatively undisturbed natural ecosystems (Figure 1). The proposed development is located in recommended wilderness about 2 miles west of the Wild Basin Ranger Station (Figure 2).

## **Purpose**

The Continental Divide runs north/south through the heart of RMNP. The park sits at the top of the watershed, and watercourses on the east side of the park are relatively unimpeded by dams or diversions. The North St. Vrain Creek originates within the park. North St. Vrain Creek flows into the St. Vrain River, which supplies water to irrigate 70,000 acres within the river basin. In addition, it is estimated that approximately 80,000 people rely upon the St. Vrain Basin for their municipal and domestic water use.

The Wild Basin Snow Survey Improvement Project would allow the NRCS to improve seasonal runoff forecasts in the St. Vrain River Basin by placing a new SNOTEL site adjacent to an existing higher elevation snow survey course. These improved forecasts would provide critical information to water users and managers in the basin, downstream from RMNP. However, the NRCS also wants to keep the existing Copeland Lake SNOTEL site because it has existed at that location since 1949 and continued data collection at the site is a valuable part of the statewide snow survey and water supply forecasting program.

## **Objectives**

The objectives of the proposed project are to:

### **Protect Park Natural Resources**

- Minimize impacts to natural and cultural resources.

### **Improve seasonal runoff forecasts for downstream water users**

- Improve forecasts of seasonal runoff in the St. Vrain River Basin.
- Improve the efficiency of the seasonal forecasts

### **Compatibility with the Site and the Park**

- Ensure the new SNOTEL site is in harmony with landscape character and does not dominate the visual character of the site.
- Ensure that the new SNOTEL site complies with park planning documents and complements the park design theme.
- Ensure that the new SNOTEL site complies with the wilderness minimum requirement analysis.

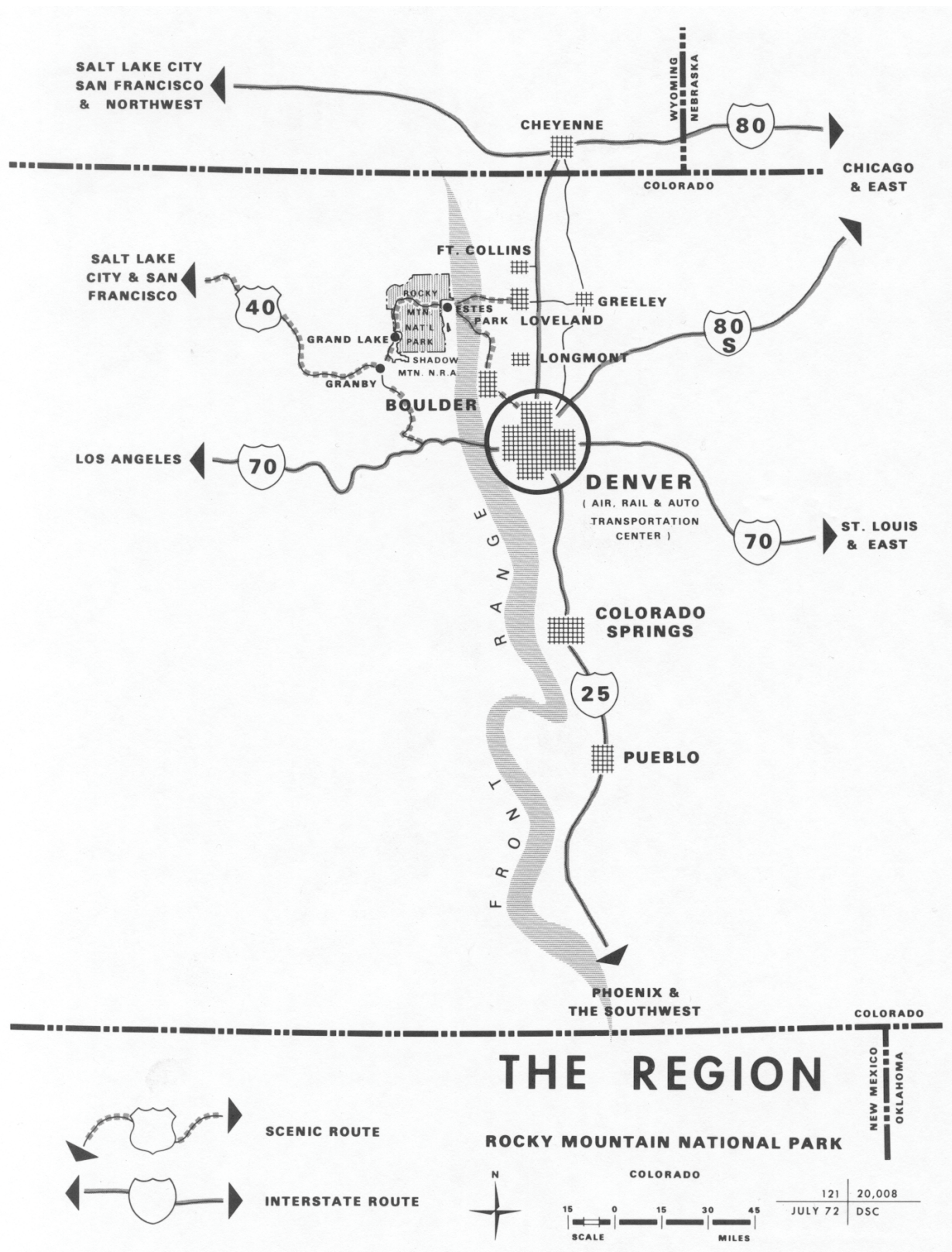


Figure 2 - Regional Context

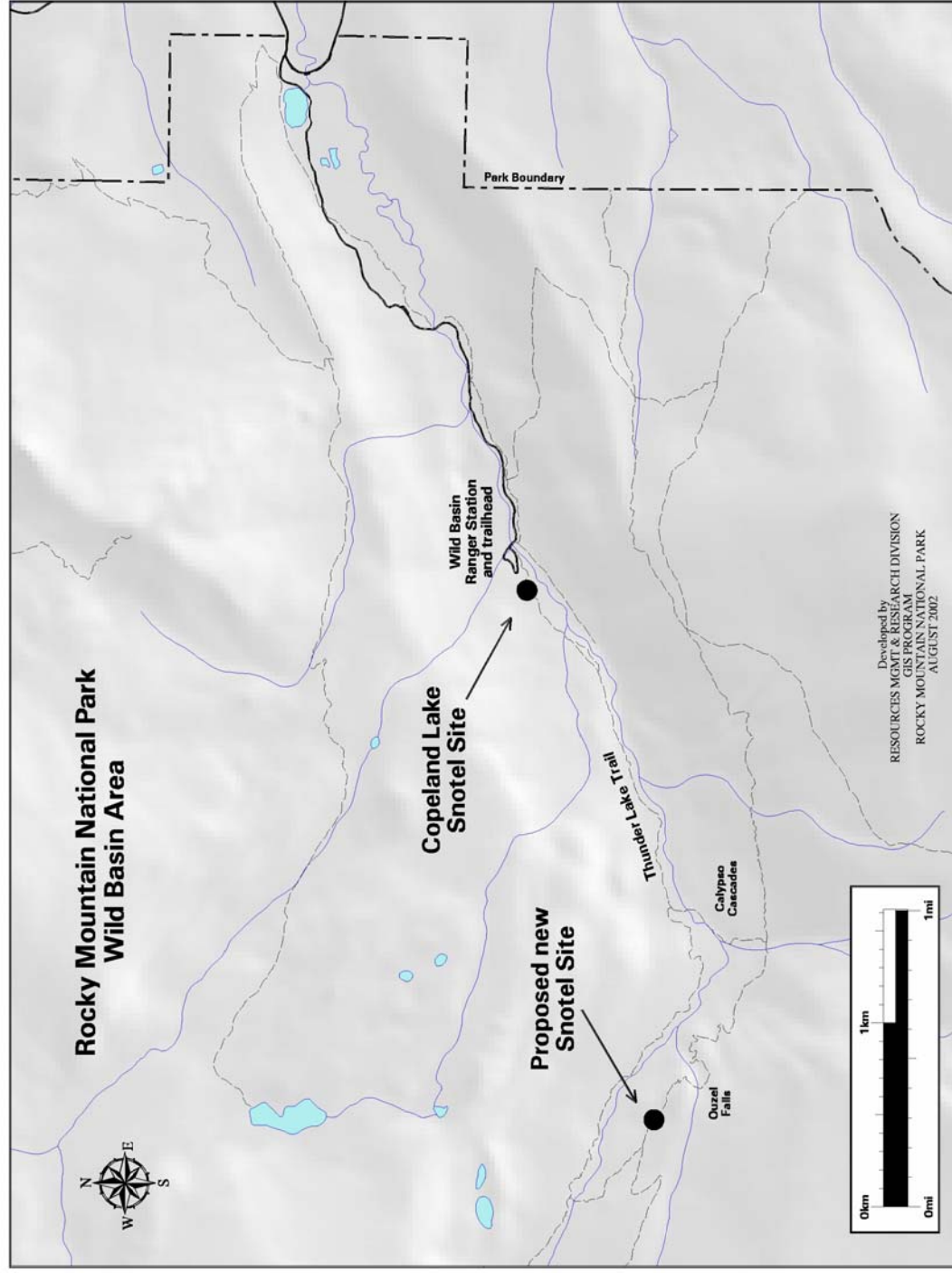


Figure 3 - Wild Basin SNOTEL Sites

### **Need for the Project**

The existing Copeland Lake site is the lowest elevation SNOTEL site east of the Continental Divide in Colorado. Primarily due to the low elevation, the Copeland Lake SNOTEL site does not provide accurate seasonal runoff forecasts. Water users and managers in the St. Vrain Basin, along with the NRCS need additional snowpack data from a higher elevation location in the St. Vrain Creek Basin inside the boundary of RMNP. Improving the existing monitoring network would yield improvements in the accuracy of the runoff forecasts. At the proposed new location for the SNOTEL site there is an existing snow course that has been in existence since 1936. The snow course is used to collect data on snow depth and water content. Data collected at the Wild Basin snow course is proven to have a superior correlation with runoff in the basin than the data collected at the existing Copeland Lake SNOTEL site. Installing a SNOTEL site near the Wild Basin snow course would allow for improved forecast accuracy.

The 70,000 acres of irrigated land in the St. Vrain Basin produce an approximate annual gross crop value in excess of \$20 million. This is a major traditional component of the local economy. In addition, it is estimated that approximately 80,000 people rely upon the St. Vrain River for their municipal and domestic water use. The management of Ralph Price, Longmont, McIntosh, Foothills, and Independent reservoirs will also benefit from an improved streamflow forecast along the St. Vrain River. Water users in the St. Vrain River Basin benefit greatly from accurate snowmelt runoff forecasts.

### **Project Background and Scope**

The snow survey program in Colorado is responsible for collecting snowpack and climatological data using snow course transects and the SNOTEL system. The snow course transects are manually measured using snow core depth and water content samples taken the last week of each winter month. The data is compiled and reported once per winter month. The SNOTEL automated system uses meteorburst communications to relay information about the water content of the snowpack, precipitation, and air temperatures to a central computer facility. The SNOTEL data is available continuously on a real time basis.

Daily precipitation and snowpack measurements from SNOTEL sites, combined with 110 manual monthly snow course measurements, are used to forecast seasonal runoff at 75 stream gauges across Colorado. Forecasts are updated monthly as the winter progresses, allowing water users and resource managers to plan for changing streamflow conditions and water supplies. Water users can access the most recent snowpack data and streamflow forecasts directly from the Colorado NRCS web page ([www.co.nrcs.usda.gov](http://www.co.nrcs.usda.gov)).

Within the North St. Vrain Basin in RMNP, the snow survey program has been active since the 1930's. Measurements have been taken at the Copeland Lake SNOTEL site since 1949. The existing equipment at the site was installed in 1978. The Wild Basin snow course has been sampled since 1936.

There have been two on site meetings with park and NRCS personnel as well as one internal scoping meeting regarding the issue of improving seasonal runoff forecasts by installing a new SNOTEL site. Park personnel have visited the site several other times to gather information for

this Environmental Assessment. The Acting Superintendent and the Chief of the Division of Resources Management and Research have discussed the issue with the Northern Colorado Water Conservancy District. No significant environmental issues of concern were identified and therefore no external scoping meetings asking for public input occurred. A full range of alternatives for meeting the project purpose and need were discussed during the internal scoping and onsite meetings.

### **Relationship to Other Planning Projects**

The proposed Wild Basin Snow Survey Improvement Project is consistent with several Park planning documents.

#### **Final Master Plan (1976)**

This document provides guidance for the overall use, preservation, management, and direction of activities in the Park. Major new development in the park is not recommended. Rather, the Master Plan recommends a rearrangement or reduction of existing facilities as necessary to meet current demands consistent with perpetuation of natural resources. Man's impact is to be minimized and controlled.

#### **Statement for Management for RMNP (1992)**

The Statement for Management contains the following guidance with respect to the Wild Basin Snow Survey Improvement Project:

- Protect Park values from adverse external and internal influences.
- Provide and maintain appropriate facilities and support services essential to the Park mission.

#### **Interagency Agreement between the NPS and the NRCS**

An Interagency Agreement was approved in 1987 for a five-year term. The agreement has not been reaffirmed, but the NRCS and NPS continue to cooperate with the program.

##### ***NPS agreed to:***

- Cooperate with the snow survey in data collection.
- Authorize the continued operation of existing SNOTEL sites.
- Make no change in the management or use of a data collection site.

##### ***NRCS agreed to:***

- Supply specialized equipment as required.
- Make an application to the superintendent to use and occupy additional NPS lands.
- Request permission from the Park Superintendent for any subsequent relocation, alterations, revisions, additions, construction or reconstruction.
- Notify the superintendent when any data sites are to be discontinued.

### **Issues and Impact Topics**

A summary of the issues that were identified and the impact topics that were considered in detail in this EA are discussed below. Other topics that were eliminated from detailed study because there are no potential impacts are also discussed.

## **Issues**

### ***Soils***

How would the equipment installed at the new site impact soil resources? If the existing Copeland Lake SNOTEL site is restored to natural condition, will the restoration be successful?

### ***Vegetation***

How much native vegetation would be lost or disturbed from the proposed improvements?

How would disturbed areas be revegetated following construction? What would be done to prevent the introduction of invasive exotic plant species?

### ***Wildlife Resources***

How would proposed improvement activities impact elk, birds and other wildlife? Would the proposed new site affect wildlife movement?

### ***Threatened, Endangered, and Sensitive (rare) Species***

Would the proposed development affect threatened, endangered, sensitive or rare species?

### ***Soundscape Management***

What would be the magnitude and duration of undesirable human-caused sound during construction activities? Would there be any impacts to the natural soundscape after construction? Would noise disturb visitors and wildlife?

### ***Wilderness***

How would the Snow Survey Improvement Project affect recommended wilderness?

### ***Water, Aquatic, and Wetland Resources***

Would any water, aquatic or wetland resources be affected by this project?

### ***Visitor Use and Experience***

The proposed development is close to one popular hiking trail. How would improvements impact park visitors?

### ***Visual Resources***

What provisions are being made to protect the scenery?

### ***Prime Farmland and other Downstream Water Users***

How would prime farmland and other downstream water users be affected by the proposed Snow Survey Improvement Project? Would there be any long-term impacts? In August, 1980, the Council on Environmental Quality (CEQ) directed that federal agencies must assess the effects of their actions on farmland soils classified by the U.S. Department of Agriculture's Natural Resource Conservation Service as prime or unique. Prime farmland is defined as soil that particularly produces general crops such as common foods, forage, fiber, and oil seed. Unique farmland produces specialty crops such as fruits, vegetables, and nuts. No prime or unique farmland exists in RMNP; however, the proposed Snow Survey Improvement Project would provide improved seasonal runoff forecasts and would benefit agricultural users.

## **Impact Topics**

### ***Impact Topics Selected for Detailed Analysis***

Impact topics were selected based on the issues identified above and the need to evaluate in detail the potential effect to resources of concern. Impact topics that were selected for detailed analysis include soils, vegetation, wildlife, sensitive or rare species, visitor experience, water, aquatic and wetland resources, wilderness, prime farmlands and other downstream water users, and visual and scenic resources.

### ***Topics Dismissed from Further Consideration***

**Environmental Justice.** Executive Order 12898, “General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations”, requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. The proposed project would not have health or environmental effects on minorities or low-income populations or communities.

**Hazardous Material.** The project area is located entirely within RMNP. There are no known hazardous materials or contaminated sites within the project area that would be affected by the alternative actions. The potential introduction of hazardous substances during construction, such as fuel, hydraulic fluid, or other chemicals, would be closely regulated.

**Energy Requirements and Conservation Potential.** RMNP would ask the NRCS to incorporate the principles of sustainable design and development into the proposed facility. Sustainability can be described as the result achieved by doing things in ways that do not compromise the environment or its capacity to provide for present and future generations. Sustainable practices minimize the short- and long-term environmental impacts of developments and other activities through resource conservation, recycling, waste minimization, and the use of energy efficient and ecologically responsible materials and techniques.

The National Park Service’s *Guiding Principles of Sustainable Design* (1993) provide a basis for achieving sustainability in planning and design, emphasizes the importance of biodiversity, and encourages responsible decisions. The guidebook describes principles to be used in the design and management of visitor facilities that emphasize environmental sensitivity in construction, use of nontoxic materials, resource conservation, recycling, and integration of visitors with natural and cultural settings. RMNP would ensure that the new SNOTEL site is designed to reduce energy costs, eliminate waste, and conserve energy resources by using energy efficient and cost-effective technology. In addition, RMNP would encourage the NRCS to follow sustainable practices and address sustainable park practices throughout construction. Construction equipment use would result in negligible energy consumption.

**Air Quality.** The proposed development would have no impact to air quality and this topic will not be addressed in the EA.

**Cultural Resources.** The proposed improvement was surveyed for cultural resources and none were found. The results of the survey will be briefly discussed in the *environmental consequences* section.

**Lightscape Management.** RMNP strives to limit the use of artificial outdoor lighting. The Snow Survey Improvement Project would have no lighting and this topic will not be addressed in the EA.

**Local and Regional Economy.** Local businesses would not be affected, but downstream users would be and this topic will be briefly discussed.

**Geology and Topography.** The proposed action would not require any change or disturbance to the local geology or topography. Therefore, geology and topography will not be addressed as an impact topic in this EA.

**Groundwater.** The proposed action will not result in any change or disturbance that would have an impact on groundwater quantity or quality. Therefore, groundwater will not be addressed as an impact topic in this EA.

**Surface Water.** The proposed action would not have any impacts on surface water quantity or quality. However, if the proposed action were approved, water management in the St. Vrain River Basin would improve. More accurate seasonal streamflow forecasts would help optimize water use decisions throughout the demand periods. Since there are no negative impacts on surface water in the park, this topic will not be addressed as an impact topic in this EA.

**Ethnographic Resources.** The proposed action would not impact ethnographic resources, and will not be addressed as an impact topic in this EA.

## **Compliance with Federal and State Regulations**

The NPS and NRCS will comply with all applicable Federal regulations when implementing the development of a new SNOTEL site. In addition, the NRCS will comply with all applicable NPS guidelines, provisions, acts, and regulations for the management of Park resources. Regulatory requirements for this project are expected to include the following:

- **National Environmental Policy Act (NEPA) and Regulations of the Council on Environmental Quality**—Whenever the NPS considers a federal action that could have impacts on the human environment, NEPA is triggered. Federal actions are defined as projects, activities, or programs funded in whole or in part under the direct or indirect jurisdiction of a federal agency, including those carried out by or on behalf of a federal agency; those carried out with federal financial assistance; those requiring a federal permit, license or approval; and those subject to state or local regulation administered pursuant to a delegation or approval by a federal agency.
- **Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.)**—Section 7 of the Endangered Species Act (ESA) is designed to ensure that any action authorized, funded, or carried out by a federal agency likely would not jeopardize the continued existence of any endangered or threatened plant or animal species. There are no threatened or endangered species within the project area. The alternatives would not have an adverse affect on threatened or endangered species.
- **Clean Water Act**—The U.S. Army Corps of Engineers is responsible for authorizing the discharge of dredged or fill materials into waters of the U.S. Including wetlands under

Section 404 of the Clean Water Act. The project area will not impact any water, aquatic or wetland resources.

In compliance with the Colorado Pollution Discharge Elimination's System (CPDES) requirements, a storm water discharge permit is required if a project disturbs greater than 5 acres (2 hectares). The Snow Survey Improvement Project will impact less than 0.1 acre. A CPDES storm water discharge permit is not required for this project.

- **Executive Order 11990, Protection of Wetlands**—This order requires federal agencies to avoid impacts to wetlands, where possible. The Snow Survey Improvement Project would not impact any wetlands.
- **Executive Order 11988, Floodplain Management**—This order requires federal agencies to avoid the construction of certain types of facilities in 100-year and 500-year floodplains unless no other practical alternatives exist. The existing Copeland Lake SNOTEL site is within a floodplain but the proposed new location is not. No adverse impact to floodplains would occur.
- **National Historic Preservation Act of 1966, as amended (16 U.S.C. 470, et. Seq.)**—Section 106 of the National Historic Preservation Act of 1966 (as amended) requires all federal agencies to consider effects from any federal action on cultural resources eligible for or listed on the National Register of Historic Places (NRHP), prior to initiating such actions. The Snow Survey Improvement Project would not adversely affect any known cultural resources eligible for NRHP listing.

## Decision Process

An Environmental Assessment (EA) analyzes the proposed action and alternatives and their impacts on the environment, cultural resources, and socioeconomics. This EA has been prepared in accordance with the National Environmental Policy Act of 1969 (NEPA) and regulations of the Council on Environmental Quality (40 CFR 1508.9). The EA will be released to the public for a 30-day comment period. The National Park Service will determine whether the environmental consequences of the proposed action require preparation of an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI).

This EA evaluates two action alternatives that involve the development of new SNOTEL site in the Wild Basin District of RMNP. A No Action alternative is evaluated for comparison. Chapter 2 describes the *Alternatives* under consideration, including the preferred alternative, and includes a summary table comparing the impacts of each alternative. Chapter 3 discusses the *Affected Environment* and the *Environmental Consequences* for each of the alternatives.

## **Chapter 2 – ALTERNATIVES CONSIDERED**

This section describes the proposed action and the other alternatives that were considered for the development of a new Wild Basin SNOTEL site. During the scoping process, a full range of alternatives for meeting the project purpose and need were developed. Criteria used in the selection of reasonable alternatives included:

- Improving seasonal runoff forecasts for the St. Vrain Basin inside RMNP.
- Ensuring that recommended wilderness is not significantly impacted.
- Protect natural and cultural resources and scenic values.

### **ALTERNATIVE 1 – No Action (No Improvements)**

The existing Copeland Lake SNOTEL site is located just inside recommended wilderness approximately 700 feet from the Wild Basin Ranger Station and parking lot. This alternative would continue the current level of data collection, which has been inadequate because of the low elevation of the site. This alternative does not allow for improvements in the accuracy of streamflow forecasting. The cost of this alternative is the continuation of current maintenance and data collection. This cost is borne by the NRCS and not the NPS. This alternative has no additional environmental effects other than the continued existence of the SNOTEL equipment.

### **ALTERNATIVE 2 – Relocate the existing SNOTEL Site (Environmentally Preferred Alternative)**

A new SNOTEL site has been identified that is located approximately 2,000 west of Ouzel Falls within RMNP. The new site would be located adjacent to a snow course that was established in 1936. The snow course is located near the 1978 Ouzel fire and near a small blow down area. It is adjacent to a hiking trail and near the Bluebird Lake Trail-Thunder Lake Trail intersection. The SNOTEL site would be located approximately 100 feet south of the hiking trail.

This alternative would consist of dismantling the existing equipment at the Copeland Lake SNOTEL site, transporting the materials and equipment to the new site, and reinstalling the equipment at the new location. For a list of the equipment and materials that would be transported to the new site, please refer to Appendix C. If the existing equipment were relocated there would be two 20-foot lattice towers installed at the site. One of the towers would have a 10-foot mast extended above it to support the antenna and solar panel. Alternatively, new equipment would be installed at the new site and the existing equipment at the Copeland Lake SNOTEL site would be removed from the park using pack animals. For a list of the equipment and materials that would be transported to the new site under this scenario, please refer to Appendix C. If new equipment were used there would be a single 20 ft. lattice tower with a 10 ft. mast attached. Under both scenarios, the existing Copeland Lake SNOTEL site would be restored to natural conditions.

If the existing equipment were relocated to the new site, several items would be upgraded. These include: installing a 10 foot diameter hypalon rubber snow pillow at the new site rather than the stainless steel pillows currently in use, and installing a snow depth sensor and an air temperature sensor on the meteorological tower near the snow pillow. These upgrades would improve the

quality of the data to current SNOTEL network standards. While the snow pillows at the Copeland Lake site are fenced, the new site would not be fenced.

If new equipment were used, it would be modified to allow for pack animal transport into the site. Installing new equipment would enable the NRCS to utilize the latest technology in sensors for snow water equivalent and precipitation. Snow water equivalent, the essential parameter in forecasting runoff, would be monitored using gamma radiation sensors. These sensors will eliminate the need for traditional snow pillows used at existing SNOTEL sites. For precipitation measurements, an optical precipitation gage will be used. This gage would eliminate the traditional storage precipitation gage. Snow depth will be measured using an acoustic depth sensor. These sensors would be installed on a meteorological tower within an existing clearing in the trees. All electronics would be housed inside a steel cabinet enclosure, which would be mounted on the same tower. No instrument shelter would be required for this installation. With this scenario, there would be one 20-foot lattice tower with a 10-foot mast – 30-foot total height. This tower would support the data sensors, electronics and antenna. The area around this new site would not require fencing.

Of the two scenarios within this alternative, installing new equipment at the new site would be environmentally preferred. Due to the size and weight of the equipment and materials at the existing Copeland Lake SNOTEL site and the distance and terrain to the new site, pack animals cannot be used. A helicopter would be needed to transport the equipment to the new site. The installation of new equipment would not require a helicopter.

Implementation of this alternative would require the removal of four (4) snags, two (2) lodgepole pines, two (2) subalpine firs, and approximately 25 subalpine fir seedlings.

The cost of relocating the SNOTEL site would be borne by the NRCS.

### **ALTERNATIVE 3 – Install a new SNOTEL site and retain the Copeland Lake SNOTEL site (Preferred Alternative)**

Install new equipment at a new SNOTEL site as discussed in Alternative 2 and retain the Copeland Lake SNOTEL site at its present location. For a list of the equipment that would be installed at the new site, please refer to Appendix C.

This option would allow for continued data collection at the Copeland Lake SNOTEL site, which has been in existence since 1949. The Copeland Lake SNOTEL site provides valuable data for streamflow forecasting during years with above average snowpack accumulations, during upslope winter storm events, and provides real-time data. In the future, this alternative would also permit NRCS to install new equipment at the existing Copeland Lake SNOTEL site as long as there was no additional environmental impact or visual impact.

### **MITIGATING MEASURES ASSOCIATED WITH ALTERNATIVES 2 AND 3**

1. Prior to implementation of either Alternative 2 or Alternative 3, the NPS and the NRCS will enter into a new Interagency Agreement that specifies the roles and responsibilities of the two agencies as they relate to NRCS operations within Rocky Mountain National Park.

2. The construction zone would be identified and delineated with construction tape prior to any construction activity. The tape would define the construction zone and confine activity to the minimum area required for construction. All protection measures would be clearly stated in the construction specifications and workers would be instructed to avoid conducting activities beyond the construction zone.
3. An NPS qualified sawyer in cooperation with the NRCS will remove the trees and require one spotter.
4. In an effort to avoid introduction of exotic plant species, no hay bales would be allowed into the backcountry to be used as mulch or to feed stock animals.
5. Vegetation impacts and potential compaction and erosion of bare soils would be minimized by conserving topsoil when it has to be removed. The use of conserved topsoil would help preserve microorganisms and seeds of native plants. The topsoil would be replaced as close to the original location as possible, and supplemented with scarification, mulching, seeding, and/or planting with species native to the immediate area if necessary. However, with the small amount of soil disturbance expected to occur, no seeding should be necessary. There are no invasive exotic plants near the existing Copeland Lake SNOTEL site or at the proposed new location. Invasive exotic plants are not considered a threat to any revegetation effort.
6. Some petrochemicals from construction equipment could seep into the soil. To minimize this possibility, equipment would be checked frequently to identify and repair any leaks.
7. Should construction unearth previously undiscovered archeological resources, work would be stopped in the area of any discovery and NRCS or NPS personnel would consult with the park's archeologist, as necessary, in accordance with 36 CFR §800.13, Post Review Discoveries. In the unlikely event that human remains are discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act (1990) would be followed.
8. The Park Service would ensure that the NRCS and their contractor are informed of the penalties for illegally collecting artifacts or intentionally damaging archeological sites or historic properties. They will be instructed on procedures to follow in case previously unknown archeological resources are uncovered during construction. Equipment and materials staging areas would also avoid known archeological resources.
9. NRCS would schedule the work with the District Ranger and coordinate with other park staff to reduce disruption to normal park activities. Equipment would not be stored along trails overnight without prior approval of park staff. Workers and supervisors will be informed about the importance of preserving park values, adhering to regulations, and appropriate housekeeping at the site.
10. If a helicopter were used, it would require a qualified NPS helicopter manager and any assistants he or she requests. The helicopter would have to be properly carded as required by the Office of Aircraft Services (OAS). The NRCS will pay for the cost of the helicopter and any overtime or other identified cost for NPS personnel. An NPS flight request form and a minimum requirement analysis would be required before the project could proceed.
11. To the maximum extent possible, all structures and equipment will be painted a flat dark green or flat dark brown color that blends with the natural colors on the site in order to camouflage the equipment.
12. If Alternative 3 is selected, no large, living trees will need to be cut at the new site. A handsaw will be used to remove the existing dead snags and small trees.

## **ENVIRONMENTALLY PREFERRED ALTERNATIVE**

The environmentally preferred alternative is determined by applying the criteria suggested in the National Environmental Policy Act of 1969 (NEPA), which is guided by the Council on Environmental Quality (CEQ). The CEQ provides direction that the Environmentally Preferred Alternative is the alternative “that causes the least damage to the biological and physical environment: it also means the alternative which best protects, preserves, and enhances historic, cultural and natural resources.” As expressed in NEPA’s Section 101, “it is the continuing responsibility of the Federal Government to:

- Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
- Assure for all generations safe, healthful, productive, and esthetically and culturally pleasing surroundings;
- Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences;
- Preserve important historic, cultural and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice;
- Achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life’s amenities; and
- Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.”

The Environmentally Preferred Alternative for the Wild Basin Snow Survey Improvement Project is Alternative 2, and the scenario which involves the installation of new equipment at the new SNOTEL site and the removal of the existing equipment at Copeland Lake SNOTEL site. However, this scenario reduces the quality and quantity of water supply forecasting data. The Copeland Lake SNOTEL site would be restored to natural conditions.

The second scenario under Alternative 2 entails moving the existing equipment at the Copeland Lake SNOTEL site about 1000 feet higher in elevation to a new site located about 2000 feet west of Ouzel Falls adjacent to the historic manually measured Wild Basin snow course. This scenario will improve the quality and quantity of water supply forecasting data for the St. Vrain Basin, but requires the installation of two 20-foot lattice towers. One of the towers would have a 10-foot mast extended above it to support the antenna and solar panel. The Copeland Lake SNOTEL site would be restored to natural conditions.

A discussion of how each alternative meets these goals follows:

### **Alternative 1 – No Action (No Improvements).**

This alternative allows for the continued operation of the Copeland Lake SNOTEL site. It does provide for the protection of natural resources. However, it does not fully meet the following provisions:

- Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences;
- Achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life’s amenities;

- Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

This alternative would not result in improved water management in the St. Vrain River Basin. In years with very high or low runoff volumes, improved water management can mitigate impacts to the fishery and riparian areas along the St. Vrain River. Without improved streamflow forecasts these benefits would not be fully realized. This alternative only partially meets the provisions of the environmental policy goals.

**Alternative 2** – Relocate the existing SNOTEL Site (Environmentally Preferred Alternative). This alternative allows for removal of the Copeland Lake SNOTEL site and the development of a new site with less impact to the environment. This alternative does improve streamflow forecasting accuracy and minimizes environmental impacts.

If the existing equipment at the Copeland Lake SNOTEL site is moved to the new site as discussed in Alternative 2, it would not meet the full provisions of the environmental policy goals and would also require the use of a helicopter. Alternative 2 does provide for the protection of natural resources and can have a smaller environmental impact than Alternative 3. It seeks to meet the environmental policy goals by improving the efficiency of seasonal runoff forecasting and attaining the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences. It fully meets all of the provisions of the national environmental policy goals for the NPS. However this alternative does eliminate the data collection at the existing Copeland Lake SNOTEL site that has been in existence since 1949.

**Alternative 3** – Install a new SNOTEL site and retain the Copeland Lake SNOTEL site (Preferred Alternative).

This alternative allows for the continued operation of the Copeland Lake SNOTEL site and the development of a new SNOTEL site approximately 2,000 feet west of Ouzel Falls. This alternative does improve streamflow forecasting accuracy. This alternative would not require the use of a helicopter and only requires one 20-foot lattice tower with a 10-foot mast. This alternative does provide for the protection of natural resources but has a larger environmental impact than Alternatives 1 or 2 because the existing Copeland Lake SNOTEL site is retained. Alternative 3 does meet some of the environmental policy goals by improving the efficiency of seasonal runoff forecasting and attaining the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences. It does not fully meet all of the provisions of the national environmental policy goals.

## **SUMMARY ANALYSIS OF THE ALTERNATIVES**

Table 1 provides a summary of the methods that each alternative would use to ensure that project objectives are met. Table 2 provides a summary comparing the potential effects of the three alternatives. Chapter 3 – *Affected Environment and Environmental Consequences* provides additional descriptions of the impact the Wild Basin Snow Survey Improvement Project will have on each resource.

Table 1 - A Comparative Summary of Alternatives

<b>Objective</b>	<b>Alternative 1 No Action</b>	<b>Alternative 2 Relocate the Existing SNOTEL Site</b>	<b>Alternative 3 Install a new SNOTEL site and retain the Copeland Lake SNOTEL site</b>
To improve streamflow forecasting accuracy within the St. Vrain River basin.	Forecast accuracy remains at current levels allowing for no improved forecast accuracy.	Additional data will be collected at a new location known to be significantly better correlated to runoff in the basin.  Discontinues the operation of the Copeland Lake SNOTEL site which is currently providing valuable data.  While forecast accuracy would be improved, that level will not be at the same level as achieved in Alternative 3.	Additional data will be collected at a new location known to be significantly better correlated to runoff in the basin.  Retains the Copeland Lake SNOTEL site that has been in operation since 1949.  Two SNOTEL sites allow for improved forecast accuracy and better water management as compared to Alternative 1 or 2.
To protect and enhance natural resources	Protection and enhancement of natural resources remains at current levels.	No increase in environmental impact. A new SNOTEL site will be developed and the existing Copeland Lake SNOTEL site will be restored to natural conditions.	Minimal environmental impacts will occur from the development of a new SNOTEL site while retaining the existing Copeland Lake SNOTEL site.

Table 2 - A Comparative Summary of Impacts by Alternative

<b>Topic</b>	<b>Alternative 1 No Action</b>	<b>Alternative 2 Relocate the Existing SNOTEL Site</b>	<b>Alternative 3 Install a new SNOTEL site and retain the Copeland Lake SNOTEL site</b>
<b>Geology/Topography</b>	No alterations to topography or geologic character.	No alterations to topography or geologic character.	No alterations to topography or geologic character.
<b>Soils</b>  <b>Soils cont.</b>	No increase in soil erosion or soil compaction.	If the Copeland Lake SNOTEL equipment is relocated to the new location, this alternative would disturb a total area of 227 sq. Ft. Included in this total are the 16' diameter snow pillow pad,	The total disturbed area would be less than 10 sq. Ft.  The ground disturbance at the Copeland Lake SNOTEL site would remain the same.

Topic	Alternative 1 No Action	Alternative 2 Relocate the Existing SNOTEL Site	Alternative 3 Install a new SNOTEL site and retain the Copeland Lake SNOTEL site
		<p>4' x 4' instrument shelter, 3' diameter precipitation gauge pad, and 2' diameter pad for the instrument tower.</p> <p>If new equipment were used, less than 10-sq. Ft. of soil would be impacted.</p> <p>The Copeland Lake SNOTEL site would be restored to natural conditions.</p>	<p>There would be a minimal increase in soil erosion and soil compaction. Pack animal traffic on Wild Basin trail will only minimally increase soil erosion and compaction.</p>
<b>Vegetation</b>	No loss of natural vegetation.	<p>If the existing equipment at the Copeland Lake SNOTEL site is relocated to the new site, it will require the removal of 1-20' tall lodgepole pine, 2-14' subalpine fir, 1-3' subalpine fir, and one 4-5" dbh snag (partial blowdown).</p> <p>Unforeseen circumstances could require the removal of 2 additional 30-40 foot pines, 1-25 foot Englemann spruce, and 1-25 foot fir. Ground cover at this site is Vaccinium sp. With no other species noted.</p> <p>If new equipment were installed at the new site, impacts would be the same as Alternative 3.</p> <p>The existing Copeland Lake SNOTEL site would be restored to natural conditions.</p>	<p>No live trees would be removed. Ground cover (mostly Vaccinium sp. With a small amount of fireweed) would be disturbed.</p> <p>Implementation of this alternative would require the removal of 1-12" dbh snag, 1-10" dbh snag, and 2-4" dbh snags, which threaten the security of the site's equipment in case of strong winds.</p>
<b>Wildlife</b>  <b>Wildlife Cont.</b>	No significant impact to wildlife.	<p>Minimal impacts to wildlife. If the existing SNOTEL equipment is moved to this site, more trees will be removed than if new equipment is installed. Helicopter noise would have a short-term</p>	<p>Minimal impacts to wildlife. Four standing dead trees would be removed.</p> <p>Retaining the existing Copeland Lake SNOTEL site would continue to have a negligible impact on</p>

<b>Topic</b>	<b>Alternative 1 No Action</b>	<b>Alternative 2 Relocate the Existing SNOTEL Site</b>	<b>Alternative 3 Install a new SNOTEL site and retain the Copeland Lake SNOTEL site</b>
		<p>impact on wildlife if one were used.</p> <p>The existing Copeland Lake SNOTEL site would be restored to natural conditions, which would be of negligible benefit to wildlife.</p>	wildlife.
<b>Threatened/ Endangered Species</b>	There are no known threatened, endangered, sensitive or rare species that would be negatively impacted.	Same as Alternative 1.	Same as Alternative 1.
<b>Surface Water</b>	There would be no impact to surface water.	Same as Alternative 1.	Same as Alternative 1.
<b>Groundwater</b>	There would be no impact to groundwater.	Same as Alternative 1.	Same as Alternative 1.
<b>Wilderness</b>	Impacts to recommended wilderness would remain the same.	<p>Minimal impact to recommended wilderness.</p> <p>Moving the existing equipment from the Copeland Lake SNOTEL site will require the use of a helicopter, which will result in temporary wilderness impacts.</p> <p>The Copeland Lake SNOTEL site will be restored to natural conditions, which would result in reduced impacts within recommended wilderness.</p> <p>This alternative will result in less impact to recommended wilderness than Alternative 3.</p>	<p>Minimal impacts to recommended wilderness.</p> <p>Retaining the existing Copeland Lake SNOTEL site would result in two SNOTEL sites in recommended wilderness.</p> <p>This alternative will result in greater impact in recommended wilderness than Alternatives 1 or 2.</p>
<b>Air Quality</b>	There will be no impact to air quality.	Same as Alternative 1.	Same as Alternative 1.
<b>Scenic and Visual Quality</b>	Visual impacts will remain the same. Equipment is well screened from a nearby trail by natural vegetation.	<p>Minimal impacts on visual quality.</p> <p>If the existing equipment at the Copeland Lake SNOTEL site is moved to the new site, there will be</p>	<p>Minimal impacts on visual quality.</p> <p>Site components would be screened from a nearby trail by natural vegetation. All existing live trees will be</p>



<b>Topic</b>	<b>Alternative 1 No Action</b>	<b>Alternative 2 Relocate the Existing SNOTEL Site</b>	<b>Alternative 3 Install a new SNOTEL site and retain the Copeland Lake SNOTEL site</b>
		with the archaeologist for RMNP were completed on July 5, 2000 and July 19, 2000. No cultural resources were recorded at the new site except for a stone fire ring that is not considered culturally significant. Surveys of the area were conducted on July 13 and July 19, 2000.	
<b>Ethnographic Resources</b>	No impacts to Ethnographic resources.	Same as Alternative 1.	Same as Alternative 1.
<b>Historic Resources</b>	No impact to historical resources.	Same as Alternative 1.	Same as Alternative 1.
<b>Prime Farmland and Socioeconomic Resources</b>	No impact to socioeconomic resources.	More accurate water supply forecasts will result in improved water management. This would favorably benefit both agricultural and municipal water users in the St. Vrain Basin.	Same as Alternative 2.
<b>Visitor Use and Experience</b>	No significant impact to visitor use and experience.	<p>Visitor use and experience would be minimally impacted during construction at the new site. Expected duration of construction is 3 to 4 days.</p> <p>If the existing equipment at the Copeland Lake SNOTEL site is moved to the new location, a helicopter would be required. Helicopter operations could result in temporary closures for short periods on the trail to Ouzel, Bluebird and Thunder Lakes.</p> <p>Helicopter operations would not be required if new equipment were installed. Pack animals are expected to use the trail to the new site over the course of 2 days.</p>	<p>Visitor use and experience would be minimally impacted during construction at the new site. Expected duration of construction is 3 to 4 days.</p> <p>Pack animals are expected to use the trail to the new site over the course of 2 days.</p>
<b>Visitor Use and Experience Cont.</b>			

Topic	Alternative 1 No Action	Alternative 2 Relocate the Existing SNOTEL Site	Alternative 3 Install a new SNOTEL site and retain the Copeland Lake SNOTEL site
<b>Park Operations</b>	No significant impacts to Park Operations expected.	During construction, several park staff will assist by managing visitor interactions and/or running helicopter operations. Helicopter, and/or pack animals and personnel cost that can be billed would be paid by the NRCS.	Same as Alternative 2 except that a helicopter is not needed.

## **Chapter 3 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES**

This chapter includes a description of the affected environment and potential environmental impacts that could occur from implementation of the No Action Alternative or either of the two action alternatives. Potential impacts were identified for each of the alternatives based on internal scoping meetings, review of relevant scientific literature and park reports, previously prepared environmental documents, field investigations, and the best professional judgment of resource specialists.

### **Methodology for Analyzing the Environmental Consequences of the Actions**

This chapter is organized by resource, and is the scientific and analytical basis for the comparison of alternatives. Impacts are described in terms of context (effects are site-specific, local, or regional), duration (short- or long-term), and intensity (none, negligible, minor, moderate, major). The intensity of an impact is defined as follows:

- No Impact – There is no discernable impact
- Negligible – The impact is at the lowest level of detection
- Minor – The impact is slight, but detectable
- Moderate – The impact is readily apparent
- Major – The impact is a severe or adverse impact, or of exceptional benefit

Short-term impacts are those that are typically less than several years, such as temporary construction disturbance. Long-term impacts last many years and sometimes result in permanent changes in land use.

Impacts may be direct, indirect or cumulative:

- Direct effects are caused by an action and occur at the same time and place as the action.
- Indirect effects are caused by the action and occur later in time or farther removed from the place.
- Cumulative effects are defined as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions” (40 CFR 1508.7). Cumulative impacts can result from individually minor, but collectively significant actions taking place over time. The Council on Environmental Quality (CEQ) regulations, which implement the National Environmental Policy Act, require assessment of cumulative impacts in the decision making process for federal projects. Cumulative impacts are considered for both the no-action and proposed action alternatives.

### ***Past Actions and Reasonably Foreseeable Activities***

Cumulative effects were determined by combining the impacts of the alternatives with potential other past, present, and reasonably foreseeable future actions. Therefore, it was necessary to identify other ongoing or foreseeable future projects within the project site. Reasonably foreseeable future activities analyzed in this EA are those actions independent of the development of a new SNOTEL site. The cumulative effects analysis includes existing

disturbances or possible future disturbances that may occur in the Wild Basin District as appropriate for each resource. The Wild Basin District is considered pristine with the vast majority of it being in recommended or designated wilderness. The improvements as discussed in Alternative 3 (the Preferred Alternative) and in Alternative 2 (the Environmentally Preferred Alternative) as part of a cumulative effect, will result in a negligible loss of habitat. These disturbances are in addition to a minor amount of other disturbances within the district. There are no other foreseeable development activities planned in recommended or designated wilderness in the Wild Basin District that would require the preparation of an EA or an EIS. The past and proposed activities and associated impacts are discussed below.

### ***Past Actions***

About 95% of RMNP is designated, recommended or potential wilderness. The project site is located within recommended wilderness. Most of the park is in pristine condition with very few past disturbances. However, a variety of previous activities have modified some resources in the backcountry/wilderness areas of the park. Disturbances that have occurred in the Wild Basin District include hiking trails, designated backcountry campsites, bridges, privies, and one backcountry cabin.

In the late 1800's and early 1900's, three natural lakes (Pear, Sandbeach and Bluebird) were dammed to increase water storage for irrigation purposes. The three dams were removed in 1988-1990. The lake levels have been restored to natural levels and the exposed lakeshores are presently reverting to natural conditions.

The 1978 Ouzel Fire burned about 1,500 acres. The results of the fire are still quite visible today. This lightning-caused fire was being managed for resource benefit when it got out of control and had to be suppressed.

In 1976, a Final Master Plan was approved that provides overall direction for the management of the park.

In 1996, a management and development concept plan was approved for Longs Peak/Wild Basin/Lily Lake that stressed the importance of leaving Wild Basin in its current "wild" condition.

In 2001, a Backcountry/Wilderness Management Plan was approved that provides direction for managing the backcountry, including designated and recommended wilderness. As required in the Backcountry/Wilderness Plan, a Minimum Requirement Analysis has been completed for the SNOTEL project (please refer to Appendix A).

### ***Reasonably Foreseeable Activities in the Wild Basin District***

The Park is currently working on an EA for hazard fuel reduction at various locations along the eastern boundary of the park. Hazard fuel reduction involves the thinning of trees and removing accumulations of dead and downed woody debris using chainsaws. This work would be conducted outside of recommended or designated wilderness areas. This EA will be released for public review and comment in mid-August, 2002. One of the areas proposed for hazard fuel reduction is located along Copeland Moraine in the Wild Basin District. No

fire management activities would be conducted where the proposed SNOTEL site would be located.

Other NEPA documents will be developed in future years that have the potential to include activities in the Wild Basin District. These include an EA or EIS for an updated, science-based Fire Management Plan, an EIS for Elk and Vegetation Management, and an EA or EIS for managing Chronic Wasting Disease. A Transportation Plan is being developed that will address the use of a park-wide shuttle bus system and expansion of parking lots.

### **Impairment of Park Resources and Values**

In addition to determining the environmental consequences of the alternatives, NPS policy requires analysis of potential effects to determine whether actions would impair park resources (Management Policies 2001).

The fundamental purpose of the national park system, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. NPS managers must always seek ways to avoid, or to minimize to the greatest degree practicable, adverse impacts on park resources and values. However, the laws do give the NPS the management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, as long as the impact does not constitute impairment of the affected resources and values. Although Congress has given the NPS the management discretion to allow certain impacts within parks, that discretion is limited by the statutory requirement that the NPS must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise. The prohibited impairment is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values. An impact to any park resource or value may constitute impairment. An impact would be more likely to constitute impairment to the extent that it affects a resource or value whose conservation is:

- Necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;
- Key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or
- Identified as a goal in the park's general management plan or other relevant NPS planning documents.

Impairment may result from NPS activities in managing the park, visitor activities, or activities undertaken by concessionaires, contractors, and others operating in the park. An impairment finding is included at the conclusion of this EA, on page 37.

### ***Comparison of Alternatives***

The type of impact for each of the development alternatives is similar, but varies primarily with the size of the disturbance. Impacts from the No Action Alternative are discussed first, followed by a description of impacts from the two construction alternatives.

## **Natural Resources**

### **Soils**

#### ***Affected Environment***

The soils at the existing Copeland Lake SNOTEL site and at the proposed new site is Tileston very cobbly, sandy loam, 10 to 40 percent slopes. This map unit is found from 9,000 to 10,500 feet elevation on sites dominated by subalpine fir-Englemann spruce/grouse whortleberry.

Parent materials are colluvium and till derived from granite, gneiss, and schist. These soils are well drained with moderate permeability and have no flooding or ponding hazard. Soil surveys in RMNP were completed in 1998. These surveys were consulted to evaluate the soils and geology of the existing Copeland Lake SNOTEL site and the proposed new site.

#### ***Effects of the No Action Alternative***

There would be no new direct impact other than what has already occurred to soil resources at the Copeland Lake SNOTEL site, which is considered negligible.

#### ***Effects of the Action Alternatives***

If new equipment is installed at the proposed new SNOTEL site, the total disturbed area is less than 10 square feet. If the Copeland Lake SNOTEL site equipment is moved to the new site and a new snow pillow pad installed as discussed in Alternative 2, the total disturbed area would be about 227 square feet. With the removal of the existing Copeland Lake SNOTEL site as proposed in Alternative 2 (the environmentally preferred alternative), about 227 sq. ft. would be restored to natural conditions.

Alternative 3 would impact 10 sq. ft. of habitat, which is in addition to the 227 sq. ft. that has already been disturbed at the Copeland Lake SNOTEL site.

The impacts to soils are considered to be long-term for both Alternatives 2 and 3.

The intensity of soil impacts at the new site is considered to be negligible if new equipment is installed and minor if the existing equipment at the Copeland Lake SNOTEL site is moved to the new site.

Improved streamflow forecasting accuracy could reduce downstream soil erosion outside the park through improved water management. For this reason, Alternatives 2 or 3 could have a moderate beneficial impact downstream and outside of the park.

#### ***Cumulative Effects***

Previous disturbances to topography, geology, and soils have occurred from the original construction of the Copeland Lake SNOTEL site and from hiking trails that exist in the area, but those disturbances are considered minor. The combined impact of past actions, the proposed action, and foreseeable projects would have a minor cumulative effect on soil resources in the area. There would be a negligible cumulative effect from the No Action Alternative.

#### ***Conclusion***

The no action alternative would have no new impacts to soils and the two action alternatives would only have a negligible to minor impact.

## **Vegetation**

### ***Affected Environment***

The proposed new SNOTEL site is located in an even-aged stand of lodgepole pine (*Pinus contorta*), with Engelmann spruce (*Picea engelmannii*) and subalpine fir (*Abies lasiocarpa*). Understory vegetation is composed of *Vaccinium* spp. A large number of standing dead trees exist in the area adjacent to the site, and a portion of the area affected by the Ouzel fire is about 300 feet south of the proposed new site.

A site survey was conducted in 2000 to inventory plant species in the vicinity of the new site. Species composition was compared to those listed in the Colorado Natural Heritage Program database and the park's endangered, threatened and rare species list (please refer to Appendix B). No listed species were found at the site.

### ***Effects of the No Action Alternative***

The existing Copeland Lake SNOTEL site has negligible long-term impacts to vegetation. Under the No Action Alternative, there would be no new vegetation disturbance or clearing. The No Action Alternative would not involve land-disturbing activities likely to increase the number and distribution of exotic or noxious weeds.

### ***Effects of the Action Alternatives***

Implementation of Alternative 3 (the Preferred Alternative) would not require the removal of live trees. However, there would be some disturbance to ground cover which is mostly *Vaccinium* sp., with a small amount of fireweed. Other than the four snags to be removed during site installation, the only impacts to vegetation would be the trampling of the smaller plants in the area during construction activities. The Preferred Alternative would have negligible impacts to vegetation resources within RMNP. Impacts from construction of the new SNOTEL site would have short-term impacts as equipment is installed. However, by following mitigation measures previously outlined in Chapter 2 on page 11, impacts to vegetation resources would be minimized.

Implementation of Alternative 2 that involves moving the existing Copeland Lake SNOTEL equipment to the new site would have a slightly larger impact, and require the removal of 4 snags, 2 live lodgepole pines, 2 live subalpine firs, and approximately 25 subalpine fir seedlings. Since moving the existing equipment to the new site would utilize a snow pillow for data collection, vegetation management around and above the pillow is required to maintain a consistent open canopy. In this regard, the impact to the vegetation resource is considered long-term.

Intensity of impacts to vegetation is considered minor from the installation activities of Alternative 2 if existing equipment is moved and the Copeland Lake SNOTEL site is restored to natural conditions. Intensity of impacts is considered negligible to minor if new equipment is installed at the new site and the Copeland Lake SNOTEL site remains as proposed for Alternative 3.

### ***Cumulative Effects***

If the existing Copeland Lake SNOTEL site is moved to the new location as described in Alternative 2, it would utilize a snow pillow for data collection. The impact to the vegetation is considered part of a minor but long-term cumulative impact in the Wild Basin District. Installing new equipment at the new site and restoring the existing Copeland Lake SNOTEL site would still be considered part of a minor cumulative impact even though there would be negligible vegetation impacts at the new site.

A minor amount of native vegetation has been previously lost at the Copeland Lake SNOTEL site, and for hiking trails and backcountry campsites in the Wild Basin District. Presently no other disturbances are planned within recommended wilderness in the Wild Basin District. The combined impact of hiking trails, backcountry campsites and the SNOTEL site(s), would have a minor cumulative effect on vegetation resources.

### ***Conclusion***

The preferred alternative would create no significant impacts to vegetation resources at RMNP. The impact to vegetation from construction of the new SNOTEL site would be negligible if new equipment is installed, and minor if the existing equipment at the Copeland Lake SNOTEL site is moved to the new location. There would be a minor benefit to vegetation if the existing Copeland Lake SNOTEL site is restored to natural conditions. Invasive exotic plants are not a concern at either of the two sites. By following the mitigation measures previously outlined in Chapter 2 (page 11) impacts to vegetation resources can be minimized.

### ***Wildlife***

#### ***Affected Environment***

Rocky Mountain National Park is home to a number of wildlife species. Some species are residents, such as elk and mule deer, while others use the Park during their migrations.

The existing Copeland Lake SNOTEL site is located in the upper montane zone. This zone provides primary winter range for deer and elk. The new site as discussed in Alternatives 2 and 3 is located in the sub-alpine zone and is within elk and deer summer range. It is not in elk and mule deer winter range.

Common mammals expected in the area include chickarees, chipmunks, golden-mantled ground squirrels, bobcats, mountain lions, coyotes, voles, mice, black bears, martens, and weasels. Birds expected in the forested upper montane and sub-alpine zones include woodpeckers, warblers, flycatchers, sharp-shinned hawks, Northern goshawk, and blue grouse.

#### ***Effects of the No Action Alternative***

Alternative 1 would have a negligible effect on wildlife. Since this alternative maintains the operation of the Copeland Lake SNOTEL site the impact to wildlife is considered to be long-term.

#### ***Effects of the Action Alternatives***

Alternative 3 (the Preferred Alternative) would have a smaller impact (10 sq. Ft.) than Alternative 2 (227 square feet) if the existing equipment at the Copeland Lake SNOTEL site was

moved to the new site. The existing Copeland Lake site has impacted 227 square feet of habitat with a negligible impact to wildlife. If new equipment were placed at the new site and equipment at the existing Copeland Lake site removed and the site restored, there would be a negligible benefit to wildlife. There would be a minor short-term impact and a negligible long-term impact to wildlife for either of the action alternatives.

Once the new SNOTEL site is installed, the equipment is silent. There will be no new trails developed because of the project. Implementation of Alternative 3 would not require the removal of live trees. However, there would be some disturbance to ground cover. During construction, there will be some trampling of the smaller plants in the area. This impact on wildlife habitat will be confined to a site-specific location.

Implementation of Alternative 2 would require the removal of a greater number of trees with possible negligible secondary impacts to wildlife. There would be short-term impact to wildlife due to noise generated during construction. Construction related noise would include the use of chain saws, power tools and possibly a helicopter. This would cause a temporary disruption and displacement of some wildlife.

### ***Cumulative Effects***

If the existing Copeland Lake SNOTEL equipment is moved to the new location as described in Alternative 2, it would utilize a snow pillow for data collection. Vegetation management around and above the pillow would be required to maintain a consistent canopy effect on snow accumulation. The impact to wildlife for either of the action alternatives is considered part of a minor cumulative but long-term impact. Presently no other disturbances are planned within designated or recommended wilderness in the Wild Basin District.

### ***Conclusion***

Either action alternative would create negligible long-term impacts to wildlife resources at RMNP. Impacts from construction of the new SNOTEL site would have short-term minor impacts as equipment is installed and all three alternatives are part of a minor cumulative impact in the Wild Basin District.

### **Endangered, Threatened, Sensitive or Rare Species**

#### ***Affected Environment***

RMNP maintains a list of endangered, threatened and rare species (please refer to Appendix B) that are known to occur in the park. The following endangered, threatened or sensitive/rare species are found, or could be found, in the Wild Basin District: Boreal toad (*Bufo boreas boreas*), Canada lynx (*Lynx canadensis*), Northern Goshawk (*Accipiter Gentilis*), Greenback cutthroat trout (*Oncorhynchus clarki stomias*), Boreal owl (*Aegolius funereus*), Black swift (*Cypseloides niger*), Rocky Mountain capshell (*Acroloxus coloradensis*), Rocky Mountain columbine (*Aquilegia saximontana*), or purple lady's slipper (*Cyripedium fasciculatum*). The Canada lynx is currently extirpated from the park, but the Colorado Division of Wildlife (CDOW) has been conducting a reintroduction program in Southwest Colorado for several years. Two of the lynx from that program moved north and spent a short time in RMNP. There are currently no known lynx in the park. The project site and existing Copeland Lake SNOTEL site

were surveyed in July 2000 and again in 2001 and no endangered, threatened, sensitive or rare species were found in the immediate area.

### ***Effects of the No Action Alternative***

Alternative 1 would have no impact on endangered, threatened, sensitive or rare species. Since this alternative maintains the operation of the Copeland Lake SNOTEL site the impact is considered to be long-term.

### ***Effects of the Action Alternatives***

Both action alternatives will have no impact on endangered, threatened, sensitive or rare species.

### ***Cumulative Effects***

A minor impact to wildlife including endangered, threatened, sensitive or rare species has occurred in the Wild Basin District because of the existing Copeland Lake SNOTEL site and other disturbances, such as hiking trails, backcountry campsites and light to heavy visitor use. Presently, no other disturbances are planned within designated or recommended wilderness in the Wild Basin District. The combined impacts from implementing either of the two action alternatives would have a minor cumulative effect on wildlife resources that includes endangered, threatened, sensitive or rare species.

### ***Conclusion***

None of the alternatives would have a negative long-term impact to endangered, threatened, sensitive or rare species in RMNP.

### ***Wilderness***

#### ***Affected Environment***

The existing Copeland Lake SNOTEL site and the proposed new site are located in recommended wilderness. The existing Copeland Lake SNOTEL site is located approximately 1000 feet west of the Wild Basin Ranger Station and about 200 feet north of the hiking trail leading to Calypso Cascade and Ouzel Falls. The existing equipment at the Copeland Lake SNOTEL site was installed in 1978. A snow course has existed at the proposed new site since 1936.

The proposed new site is located about 2,000 feet west of Ouzel Falls and 100 feet south of the trail leading to Ouzel and Bluebird Lakes or Thunder Lake.

### ***Effects of the No Action Alternative***

Alternative 1 would result in no additional equipment within the Park. This Alternative would maintain the existing Copeland Lake SNOTEL site. There would be no additional impacts within the wilderness environment. Ongoing maintenance of the existing Copeland Lake SNOTEL site and use of the two existing snow courses would have a long-term negligible impact on recommended wilderness.

### ***Effects of the Action Alternatives***

Alternative 2 will have a smaller impact on recommended wilderness if new equipment is installed at the proposed site and the existing equipment at the Copeland Lake SNOTEL site is

removed from the park. There will be slightly greater impacts to wilderness if the existing equipment at the Copeland Lake SNOTEL site is relocated to the new site. This is primarily due to the necessity of using a helicopter to transport the existing equipment to the new site.

Alternative 3 would leave two SNOTEL sites in operation, which would place additional equipment into recommended wilderness. Alternative 3 would have a larger long-term impact than Alternative 2, but that impact is very localized and considered a minor impact to recommended wilderness.

Using new equipment at the proposed new site as discussed in Alternatives 2 and 3 would reduce the wilderness impacts at the new site by eliminating the need for larger equipment and structures, and by eliminating the need for helicopter transport.

Some hikers would experience short-term temporary impacts from development activities at the proposed new site. This impacts could include: the use of pack animals to transport equipment and supplies, helicopter noise if equipment is transported from the existing Copeland Lake SNOTEL site, and noise from construction activities. It is anticipated that helicopter transport of existing equipment can be done in 4 hour's time. The construction phase would be a local impact of short duration, but would result in a moderate impact to hikers walking by the site during that time. If a helicopter is used it is anticipated that the trail to Ouzel, Bluebird and Thunder lakes would be temporarily closed for short periods of time when the helicopter was in the vicinity. NPS personnel would have to be stationed along the trail above and below the construction site to keep visitors from walking into the flight path of the helicopter.

Development of the proposed new site would result in a long-term minor wilderness impact to hikers due to the visual intrusion of the equipment. For comparison, other visual impacts of a similar or larger size have occurred in recommended wilderness. These impacts include bridges with steel beams, backcountry cabins, hitch racks for horses and llamas, privies, backcountry campsites, signs and hiking trails. Since the proposed SNOTEL site would be an ongoing activity within the wilderness, its presence is considered a long-term minor impact upon the wilderness environment.

### ***Cumulative Effect***

A minor overall impact to wilderness has occurred in the Wild Basin District with some moderate localized impacts because of the existing Copeland Lake SNOTEL site, hiking trails, one backcountry cabin, backcountry campsites, stock use and heavy to light visitor use.

Presently no other disturbances are planned within designated or recommended wilderness in the Wild Basin District. A Backcountry/Wilderness Management Plan was approved in 2001. The NPS determined in the Finding of No Significant Impact (FONSI) that the present management of the backcountry/wilderness in RMNP will not constitute impairment to its resources and values. As required in the Backcountry/Wilderness Management Plan, a Minimum Requirement Analysis was completed for this project. The Minimum Requirement Analysis determined that the preferred alternative includes the minimum equipment necessary to maintain superior runoff forecasts for downstream water users (please refer to Appendix A).

## ***Conclusion***

Alternative 1 would result in no additional impacts to recommended wilderness within RMNP.

The impacts of the construction phase of Alternatives 2 and 3 are expected to be of a short-term nature. There would be a minor long-term impact to the wilderness environment due to visual impacts from a nearby hiking trail. Alternative 2 would have a smaller impact on recommended wilderness if new equipment were installed at the proposed new site.

## **Visual Quality**

### ***Affected Environment***

The Copeland Lake SNOTEL site and the proposed new site have a high level of scenic beauty with coniferous forest dominating the viewshed. RMNP is considered to have some of the most spectacular scenery in Colorado, and attracts visitors from around the world.

### ***Effects of the No Action Alternative***

Alternative 1 would result in no additional equipment within the Park. This Alternative would retain the existing Copeland Lake SNOTEL site. This Alternative would create no additional impacts to the visual quality of the Park, and current impacts are considered negligible.

Retaining the existing Copeland Lake SNOTEL site would have a minor long-term impact.

### ***Effects of the Action Alternatives***

Alternative 3 (the Preferred Alternative) would have a minor impact to the scenic quality of the park. The equipment would consist of a 20-foot tower with a 10' mast, which would hold a small array of solar panels. All of the sensors for the SNOTEL measurements will be mounted on this tower or placed just below ground level. Wherever possible, the site components will be camouflaged to preserve the integrity of the viewshed. Tests conducted in the area indicate that the tower and equipment would not be visible from the Bluebird Lake trail, which is located near the site and at a higher elevation.

A wildland fire at either the Copeland Lake SNOTEL site or at the proposed new site that consumed the tree cover would make each site more visible until the forest cover was reestablished.

The new site is located approximately 100 feet south of the trail and existing trees would screen the site from the hiking trail. In addition, site components would be painted a muted earth tone color to blend with tree trunks and soil. The visual impacts associated with Alternative 3 are considered to be minor but would be a long-term impact at a site-specific location.

If Alternative 2 were selected, there would be a greater level of visual impact if the existing equipment from the Copeland SNOTEL site were relocated to the new site. Two 20-foot towers (one with a 10-foot mast extended above it) would be required instead of a single 20-foot tower with a 10-foot mast. However, tests conducted at the site indicate that the 30-foot structure would not be visible from the Bluebird Lake trail, which is located near the site and at a higher elevation. If new equipment were installed at the new site, the impacts would be the same as discussed for Alternative 3. Since the proposed SNOTEL site would be an ongoing activity, its presence at the new location would be considered a long-term minor visual impact.

### ***Cumulative Effects***

A minor impact to visual quality would occur if Alternative 3 (the preferred alternative) or Alternative 2 (the environmentally preferred alternative) is implemented. Presently no other disturbances are planned in the Wild Basin District and Alternative 2 or 3 will not have a significant cumulative impact on the visual quality of the area.

### ***Conclusion***

Impacts upon the visual quality of RMNP by Alternative 2 or 3 are confined to a site-specific location and considered a minor impact. However, given that this site will be maintained into the foreseeable future, it would be a long-term impact.

### **Natural soundscape**

#### ***Affected Environment***

The area around the existing Copeland Lake SNOTEL site and the proposed new site exhibit a superb natural soundscape with little impacts caused by humans. Typical sounds are primarily restricted to those of a natural origin. The largest impact to the soundscape involves commercial aircraft flying overhead, which is not related to this EA. Both sites are close to popular hiking trails, which are subject to increased noise from human activity.

#### ***Effects of the No Action Alternative***

Alternative 1 would result in no additional equipment installed within the Park. This Alternative would retain the existing Copeland Lake SNOTEL site. This Alternative would create no additional noise impacts. The operation and maintenance of the existing Copeland Lake SNOTEL site would have no long-term impact on the natural soundscape.

#### ***Effects of the Action Alternatives***

If Alternative 3 (the preferred alternative) is selected there would be a short-term increase in manmade noise in the area surrounding the new site during construction. However, this noise will be minimized since no motorized equipment would be used to cut trees or mix cement. After the installation is completed, no noise is emitted from the site while in operation. The noise impacts associated with Alternative 3 would be of short-term duration and within a site-specific location. The intensity of these impacts is considered negligible.

If Alternative 2 (the environmentally preferred alternative) is selected and the existing equipment at the Copeland Lake SNOTEL site is relocated to the proposed new site, a helicopter would be required to transport the equipment. The helicopter would create disturbance to the natural soundscape for approximately 4 hours. A chainsaw may be used at the new site for a short time to remove a few live trees. Chainsaw operations would occur prior to helicopter use.

If Alternative 2 is selected and new equipment is installed at the new site, the impact to the natural soundscape at the proposed new site would be the same as Alternative 3. There would be minor noise impacts at the existing Copeland Lake SNOTEL site as the equipment is dismantled and removed from the park.

The only foreseeable future impacts to the natural soundscape associated with Alternative 2 would be related to the replacement of a failed snow pillow or precipitation gauge, or the

eventual replacement of the instrument shelter. In these cases, a helicopter may be needed to transport the equipment. The intensity of these short-term impacts to the natural soundscape is moderate. Long-term impacts are minor.

### ***Cumulative Effects***

Presently no other disturbances are planned in the Wild Basin District. However, trail projects, search and rescue operations and wildland fire fighting often require the use of a helicopter. Sometimes chainsaws and other power equipment must also be used for these activities. The use of helicopters and power equipment disturbs the natural soundscape. Heavy visitor use along hiking trails, particularly from the Wild Basin Trailhead to Calypso and Ouzel Falls, has an impact on the natural soundscape that is part of a cumulative impact. The cumulative impact to the natural soundscape from the construction and operation of a SNOTEL site is considered a negligible cumulative impact.

### ***Conclusion***

The only anticipated impacts to the soundscape are associated with the construction activities during installation. A moderate, short-term, one-day impact to the natural soundscape would occur if a helicopter were used as discussed in Alternative 2. If Alternative 2 is selected and new equipment is installed at the new site, there would be a minor short-term impact to the natural soundscape. If Alternative 3 were selected there would be a minor short-term impact. There would be a negligible long-term impact to the natural soundscape if any of the Alternatives are implemented.

## **Cultural Resources**

### ***Affected Environment***

The earliest evidence of human exploitation in the mountain area of the Platte River Basin is the remains of hunting sites dated to approximately 10,000 years before present (B.P.). Hunting and other types of sites are prevalent throughout the area at various periods and at various elevations (Gilmore, et. Al. 1999).

The National Historic Preservation Act requires agencies to take into account the effects of their actions on properties listed or eligible for listing on the National Register of Historic Places. The process begins with an identification and evaluation of cultural resources for National Register eligibility, followed by an assessment of effect on those eligible resources, and concluding after a consultation process. If an action (undertaking) could change in any way the characteristics that qualify the resource for inclusion on the National Register, it is considered to have an effect. No historic properties affected means that no cultural resources are effected. No adverse effect means there could be an effect, but the effect would not be harmful to those characteristics that qualify the resource for inclusion on the National Register. Adverse effect means the effect could diminish the integrity of the characteristics that qualify the resource for the National Register.

Consultation with the Colorado State Historic Preservation Officer and with the archaeologist for RMNP was completed on July 5, 2000 and July 19, 2000 (please refer to Appendix D). A fire ring was located within the impacted area, however this was not considered significant because it was evidently assembled more recently. No cultural resources were recorded in the area of

potential effect (APE) at the proposed new SNOTEL site. If cultural resources are discovered during construction, the park's archeologist would be consulted and guidance in Section 106 of the National Historic Preservation Act of 1966 followed.

#### ***Effects of the No Action Alternative***

The no action alternative will maintain existing conditions within RMNP. There would be no impacts associated with this alternative that would affect historic or cultural resources.

#### ***Effects of the Action Alternatives***

Installing equipment as described in Alternative 2 or 3 would have a long-term, yet negligible, effect on the historic resources and cultural landscape within the Park. Since there are no cultural qualities that qualify for listing on the National Register, there will be no adverse effect from any of the alternatives.

#### ***Cumulative Effects***

Since there are no cultural qualities that qualify for listing on the National Register, the two action alternatives will have no cumulative impact on the historic resources and the cultural landscape within the park.

#### ***Conclusion***

The alternatives would have no impacts to historic resources and cultural landscapes at RMNP.

### **Prime Farmland and Socioeconomic Resources**

#### ***Affected Environment***

Water plays a critical role for prime farmland and in the socioeconomics of Colorado. The majority of surface water supplies in Colorado (94% of annual consumptive use) are used for irrigation of agricultural land. Of the water used for irrigation, about 40% is allocated for use in the South Platte River Basin. RMNP contains the upper watershed of St. Vrain Creek, which flows into the South Platte River. RMNP has no prime farmland, but the watershed within the park provides water for irrigation of prime farmland and municipal water supplies located downstream.

The value of Colorado's crops produced in 1997 was \$1.3 billion. Approximately three-fourths of this total value depended upon irrigation. These crops form the basis for Colorado's livestock industry, which produced \$3.2 billion in sales in 1997. Weld County, which is located within the Platte River Basin, is the state's highest-ranking agricultural county when measured by the value of agricultural cash receipts.

#### ***Effects of the No Action Alternative***

Alternative 1 would not change snow data collection and there would be no changes in runoff forecasting accuracy. Existing forecasting products would continue to be available. Alternative 1 would continue to benefit prime farmland and socioeconomic resources.

#### ***Effects of the Action Alternatives***

Implementing Alternative 3 (the preferred alternative) would improve streamflow forecasts on the St. Vrain Creek. These improvements could consist of increased accuracy of seasonal

volume forecasts, and the eventual development of simulation models that would yield peak flow, low flow as well as short-term volume forecasts. The existing Copeland Lake SNOTEL site provides valuable data in years with high snowpack accumulations or during winter upslope snowstorms. By developing a new SNOTEL site at a higher elevation while maintaining the existing Copeland Lake SNOTEL site, forecasting accuracy could be maximized though variable snow accumulation years.

Improved forecasts would have a beneficial impact on agricultural and municipal water users within the St. Vrain Creek drainage basin. These beneficial impacts would be long-term since water management within the basin would be ongoing.

Alternative 2 would provide improved snowpack data collection for the St. Vrain Basin within the park but would eliminate data collection at the Copeland Lake SNOTEL site. Because of the loss of data at the Copeland Lake SNOTEL site, improvements in forecasting would be limited, particularly during upslope winter storm events or during years with major snowpack. The benefits to prime farmland and socioeconomic resources associated with this alternative are at a lower level than the preferred alternative.

### ***Cumulative Effects***

No other improvements or projects are planned within RMNP that would contribute to cumulative effects to prime farmland or socioeconomic resources.

### ***Conclusion***

Alternative 3 (the preferred alternative) would improve streamflow forecasting along the St. Vrain Creek. These improvements would provide overall positive impacts for water management within the basin. These benefits to prime farmland and socioeconomic resources would be long-term.

## **Visitor Use and Experience**

### ***Affected Environment***

RMNP is one of the most popular tourist attractions in Colorado, and the Wild Basin District of the park is well known to visitors for its solitude and pristine condition. Visitation to the area is limited by a narrow dirt road and limited parking available at various parking locations along the road. A Development Concept Plan for Wild Basin/Longs Peak and Lily Lake was completed in 1996. In this planning document, park management made a deliberate decision to keep “Wild Basin wild” by not widening the road or providing additional parking spaces. Visitors to Wild Basin have ready access to high elevation alpine ecosystems and opportunities for wildlife viewing. Visitors seeking a more remote backcountry experience often choose the Wild Basin area.

The existing Copeland Lake SNOTEL site and the proposed new location are located adjacent to a popular hiking trail. Because it is located closer to the trailhead, more visitors will pass the Copeland Lake SNOTEL site than the proposed new site. The majority of visitors that leave the Wild Basin trailhead only hike as far as Calypso Cascades or Ouzel Falls. Fewer visitors will hike beyond Ouzel Falls and past the proposed new site.

### ***Effects of the No Action Alternative***

The existing Copeland Lake SNOTEL site would remain and would continue to have a negligible impact on visitor use. The equipment is well hidden from sight is only noticed by very few, very observant visitors. The SNOTEL site has been in existence since 1949 and the existing equipment since 1978. There have been no complaints from visitors about this site.

### ***Effects of the action Alternatives***

Although Alternative 3 (the Preferred Alternative) would have minimal visual impacts, it will be seen by some visitors at a location that is well inside recommended wilderness, and it will add one more SNOTEL site to the park.

There are presently five SNOTEL sites in the park (Lake Irene, Phantom Valley, Willow Park, Bear Lake, and Copeland Lake). All are located in recommended wilderness. The proposed new location would have a minor to moderate level of impact to visitors. Some visitors will be surprised to encounter such a man-made intrusion in an area of the park where such intrusions are not expected. Vegetation in the area would screen most of the equipment from passing hikers.

If the existing equipment at the Copeland Lake SNOTEL site is moved to the new location as proposed in Alternative 2, there would be a greater potential impact on visitor experience due to the presence of additional equipment and structures.

The impact on visitor experience would be less if new equipment were installed at the proposed new site as proposed in Alternative 2 or Alternative 3.

Since the new site would be used for ongoing data collection, these impacts are considered long-term.

The use of a helicopter as discussed in Alternative 2 would have a moderate short-term one day impact on visitor use. The trail near the new site would have to be temporally closed as the helicopter dropped off equipment. It is anticipated that the trail near the existing Copeland Lake SNOTEL site would not be closed. Using pack animals to move equipment to the new site would have a minor impact on visitors.

### ***Cumulative Effects***

Cumulative impacts in the backcountry/recommended wilderness of the park include hiking trails, backcountry campsites, bridges, and privies. Most park visitors consider these facilities essential and expect them to be available. The proposed action would be part of a minor cumulative impact to visitor use experience. SNOTEL sites that presently exist in the park are an intrusion on the landscape, but are not subject to visitor complaints.

### ***Conclusion***

The two action alternatives would have a negligible to minor long-term impact on visitor use and experience. Installing new equipment at the proposed new SNOTEL site would have less impact than if the existing equipment at the Copeland Lake site were moved. If the existing equipment were moved, the use of a helicopter would have a short-term one-day impact on visitor use in the

area. A small number of visitors would be moderately impacted if they encountered the new SNOTEL site.

## **Park Operations**

### ***Affected Environment***

RMNP is recognized internationally as one of the world's most outstanding natural treasures. The Park encompasses an area of 415 square miles. Hiking is available on 346 miles of trails. During 2001, the Park recorded over 3.2 million recreation visits. The park's wilderness areas offer outstanding opportunities for solitude and recreation. Most park trails are located in recommended wilderness, giving visitors the opportunity to explore and enjoy this unique resource. The park has a staff of about 450 employees during the busy summer season and a significantly smaller staff during the winter months.

### ***Effects of the No Action Alternative***

The no action alternative would have no impact on park resources and area operations. This alternative would not change existing operations within the park and would therefore produce no additional impacts upon park staff.

### ***Effects of the Action Alternatives***

Implementing Alternative 3 (the Preferred Alternative) would have a minor impact to park operations since park staff would be involved to a small degree in the movement and installation of equipment. While the majority of the transportation and installation of the site's equipment would be performed by the NRCS and contractors (packing equipment into and out of the site), there would be some oversight needed by NPS staff. These needs are anticipated to be the greatest during the two days of transporting materials along the trail, where visitor encounters would be the greatest. It is anticipated that NPS oversight will not be needed during the 2-3 days of equipment installation. Therefore, the duration of the impact to park staff and park operations is expected to be a short-term. The context of these impacts would be confined to the Wild Basin District.

Implementation of Alternative 2, with relocation of the existing equipment at the Copeland Lake SNOTEL site, would have the greatest impact upon park staff and park operations since a helicopter would be required. A qualified NPS helicopter manager and one or more assistants would be needed to prepare sling loads and load and unload the equipment. In addition, at least two uniformed employees would be needed to close and open the hiking trail above Ouzel Falls when equipment is being dropped. Although these impacts would be of short duration, they would be a moderate impact. There would be a negligible long-term impact to park staff if Alternative 2 were selected.

### ***Cumulative Effects***

Alternative 2 or 3 would have a negligible to minor long-term cumulative impact to park operations. Depending on the time of year the work is completed, the two action alternatives would cause a minor to moderate disruption to park operations. The SNOTEL sites are maintained by NRCS and not by park staff, so the two action alternatives would have a negligible long-term cumulative impact on park staff and operations. Additional staff time could

be required when there is a request by the NRCS to conduct maintenance or equipment replacement that would require the use of pack animals or a helicopter.

### ***Conclusion***

The action alternatives are expected to result in a short-term minor to moderate impact to park operations, but a negligible to minor long-term impact.

### **Summary of the environmental consequences of the proposed action alternatives**

The No Action Alternative would result in negligible to minor impacts to park natural and cultural resources, prime farmland and socioeconomics. It would not provide improved streamflow forecasting for downstream water users.

The two action alternatives would also have long-term negligible to minor impacts to park natural and cultural resources, visitor use, park operations and prime farmland and socioeconomics, but would provide improved streamflow forecasting for downstream users.

One option in Alternative 2 (removing the existing Copeland Lake SNOTEL and moving existing equipment to the new site) would require the use of a helicopter and have a moderate short-term impact on park resources.

Installing new equipment at the proposed new SNOTEL site as proposed in Alternative 2 (the Environmentally Preferred Alternative) would result in the greatest benefit to park resources. If this alternative was implemented, the equipment at the Copeland Lake SNOTEL site would be removed from the park and the site restored to natural conditions. There would be only one SNOTEL site in Wild Basin and negligible to minor impacts. However, this alternative would not be ideal for the NRCS SNOTEL program and would have a lower benefit to downstream users.

Alternative 3 (the Preferred Alternative) would provide a higher benefit to downstream users with a slightly higher impact to park resources than Alternative 2 because there would be two SNOTEL sites in the Wild Basin District instead of one.

### **Conclusion**

Because the actions described in any of the alternatives do not severely affect a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Rocky Mountain National Park; (2) key to the natural or cultural integrity of the memorial or to opportunities for enjoyment of the memorial; or (3) identified as a goal in the park's general management plan or other relevant National Park Service planning documents, there would be no impairment of the park's resources or values.

## **Chapter 4 – CONSULTATION AND COORDINATION**

### **AGENCIES/TRIBES/ORGANIZATIONS/INDIVIDUALS CONTACTED**

U. S. Fish and Wildlife Service  
Colorado State Historic Preservation Office  
Northern Colorado Water Conservancy District  
St. Vrain and Left Hand Water Conservancy District

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Natural Resource Conservation Service. 2000. Soil survey of Rocky Mountain National Park, Colorado, Parts of Boulder, Grand, and Larimer Counties, CO.

## **LIST OF RECIPEINTS**

### **Elected Officials**

Boulder County Commissioners  
Larimer County Commissioners  
Todd Saliman – Colorado House District 11  
Tim Fritz – Colorado House District 51  
Bob Bacon – Colorado House District 53

### **Elected Officials, Cont.**

Al White – Colorado House District 56  
Joan Fitz-Gerald – Colorado Senate District 13  
Stan Matsunaka – Colorado Senate District 15  
Bob Shaffer – U.S. House of Representatives  
Mark Udall – U.S. House of Representatives  
Scott McInnis - U.S. House of Representatives  
Wayne Allard – U.S. Senate  
Ben Nighthorse Campbell – U.S. Senate

### **Federal Agencies**

Bureau of Reclamation  
Environmental Protection Agency (EPA)  
Natural Resources Conservation Service (NRCS)  
Arapaho and Roosevelt National Forest  
U.S. Army Corps of Engineers

### **Media**

Boulder Daily Camera  
Denver Post  
Estes Park Trail-Gazette  
Fort Collins Coloradoan  
Longmont Times-Call  
Loveland Reporter-Herald  
Rocky Mountain News

### **Organizations**

American Alpine Club  
American Lands Alliance  
Audubon Society  
Boulder County Farm Bureau  
Boulder Valley Conservation District  
Central Colo. Water Conservancy District  
Colorado Environmental Coalition  
Colorado Fish & Wildlife Assistance  
Colorado Mountain Club

Colorado Natural Areas Program  
Colorado Natural Heritage Program  
Colorado Open Lands  
Colorado Wildlife Heritage Fund  
District 6 Water Conservancy  
Environmental Defense  
Highland Ditch Company  
Land and Water Fund  
League of Women Voters  
Longmont Conservation District  
Northern Colo. Water Conservancy District  
National Parks and Conservation Association  
Sierra Club  
St. Vrain & Left Hand Water Conservancy District  
Supply Ditch Company  
The Conservation Fund  
The Nature Conservancy  
The Trust for Public Land  
The Wilderness Society  
Trout Unlimited  
Wilderness Watch

### **State and Local Agencies**

Boulder County Parks and Open Space  
City of Longmont – Water Resources  
Colorado Department of Natural Resources  
Colorado Division of Water Resources  
Colorado Division of Wildlife  
Colorado Historic Preservation Office  
Colorado Office of Emergency Management  
Colorado State Forest Service  
Colorado Water Conservation Board  
Town of Estes Park  
Town of Mead

# Appendix A - Minimum Requirement Analysis Worksheet

## MINIMUM REQUIREMENT ANALYSIS WORKSHEET ROCKY MOUNTAIN NATIONAL PARK

ROMO-180 (3/2000)



**PROPOSED ACTION:** Install a new, modified, SNOTEL site **DATE:** May 17, 2002

**LEAD PERSON(S):** Michael Gillespie **WORK UNIT(S):** NRCS Snow Survey Office

### PART A: Minimum Requirement *(should the action be done in wilderness)*

**1** IS ACTION AN EMERGENCY?

YES

NO

ACT ACCORDING TO  
APPROVED EMERGENCY  
MINIMUM TOOL CRITERIA

Answer: ☐ Yes ☒ No

Explain:

**2** DOES ACTION CONFLICT WITH LEGISLATION,  
PLANNED WILDERNESS GOALS, OBJECTIVES  
OR FUTURE DESIRED CONDITIONS?

YES

NO

DO NOT DO IT

Answer: ☐ Yes ☒ No

Explain:

**3** IS ACTION PRE-APPROVED BY  
THE WILDERNESS AND BACKCOUNTRY  
OR OTHER PARK MANAGEMENT PLAN?

YES

NO

DO ACCORDING TO  
APPROVED CRITERIA

Answer: ☐ Yes ☒ No

Explain: The installation of SNOTEL sites is addressed in the Rocky Mountain National Park Backcountry/Wilderness Management Plan and Environmental Assessment, July 2001, in section 2.1.4.8.15. The proposed Snotel site is within Management Class 3.

**4** CAN ACTION BE ACCOMPLISHED  
THROUGH A LESS INTRUSIVE ACTION THAT  
SHOULD BE TRIED FIRST? (Visitor Education...)

YES

NO

DO IT

Answer: ☐ Yes ☒ No

Explain: The only less intrusive action is a snow course, which currently exists. This snow course is not providing satisfactory data. A SNOTEL site provides significantly improved data for resource monitoring.

<b>5</b>	CAN ACTION BE ACCOMPLISHED OUTSIDE OF WILDERNESS AND STILL ACHIEVE ITS OBJECTIVES?
	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>YES</p> <p>↓</p> <div style="border: 1px solid black; padding: 5px; width: 100px;">DO IT THERE</div> </div> <div style="text-align: center;"> <p>NO</p> <p>↓</p> <div style="border: 1px solid black; padding: 5px; width: 100px;">DO PART B</div> </div> </div>

Answer: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Explain: Data is needed within the water producing zone (between elevations 9,000' to 11,000') to improve existing streamflow forecasts on the St. Vrain River.
--

**PART B: Minimum Tool (*how the action should be done in wilderness*)**

Page 1 of 2

<b>6</b>	DESCRIBE, IN DETAIL, ALTERNATIVE WAYS TO ACCOMPLISH THE PROPOSED ACTION * (These may include, primitive skill/tool, mechanized/ Motorized, and/or combination alternatives) (Use addition pages if necessary)
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* Minimum questions to answer for each alternative: What is proposed? Where will the action take place? When will the action take place? What design and standards will apply? What methods and techniques will be used? How long will it take to complete the action? Why is it being proposed in this manner? What mitigation will take place to minimize action impacts?
---

<b>7</b>	EVALUATE WHICH ALTERNATIVE WOULD HAVE THE LEAST OVERALL IMPACT ON WILDERNESS RESOURCES, CHARACTER AND VISITOR EXPERIENCE **
----------	--

** Minimum criteria used to evaluate each alternative: Biophysical effects Social/Recreational/Experiential effects Societal/Political effects Health/Safety concerns Economical/Timing considerations
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<b>8</b>	SELECT AN APPROPRIATE, PREFERRED ALTERNATIVE
----------	---

<b>9</b> ATTACH TO APPROPRIATE PROJECT PROPOSAL/CLEARANCE FORM FOR REVIEW AND APPROVAL/DISAPPROVAL SIGNATURE
--

Alternative 1: See attached Environmental Assessment. No action alternative, which continues the current level of data collection. It does not allow for improvements in the accuracy of streamflow forecasting. This alternative has no additional environmental effects other than the continued existence of the SNOTEL equipment at the Copeland Lake site.

Alternative 2: See attached Environmental Assessment. Install the essential components of a SNOTEL site near the existing Wild Basin snow course and remove the existing Copeland Lake SNOTEL site. This new SNOTEL site would either be modified to allow for pack animal transport of all equipment into the site for installation or the existing Copeland Lake SNOTEL equipment moved to the new site that would require the use of a helicopter. The site would utilize state-of-the-art electronic sensors to collect snow water equivalent, snow depth, precipitation and temperature data. All sensors and telemetry equipment would be mounted on one tower. Site components would be painted wherever possible and existing trees would be used to screen the site from visitor's view. Continued on attached sheet.

Alternative 3: See attached Environmental Assessment. This alternative would consist of adding a new SNOTEL site adjacent to the existing Wild Basin Snowcourse with modified equipment that could be packed to the site by stock animals and leaving the existing equipment at the Copeland Lake site. It would result in having two SNOTEL sites instead of one in backcountry/recommended wilderness.

**List preferred alternative and give justification:** See attached Environmental Assessment. Alternative 3 is the preferred alternative but Alternative 2 is the environmentally preferred alternative. Alternative 2 has a smaller impact on recommended wilderness if new equipment is installed and the existing equipment from the existing Copeland Lake SNOTEL site is removed and the site restored to natural conditions. It will also not require a helicopter. If the existing equipment at the Copeland Lake site is moved to the new site, Alternative 2 would have a larger short-term impact than Alternative 3 and require a helicopter, but would result in only one SNOTEL site instead of two. Alternative 2 and 3 provides improved data collection necessary for improved streamflow forecasting, while minimizing impacts to the environment. Alternative 3 could disturb a smaller area, reduce the visual impacts of the site by eliminating the need for larger scale components, and can be transported by means of pack stock rather than a helicopter but results in having two SNOTEL sites in the backcountry/wilderness than only one.

Page 2 of 2

Continued from Alternative 2, page 2. Minimum Requirement Analysis Worksheet. Installation would require approximately four days to complete. Installation would be scheduled during September, prior to the snow accumulation season, yet when visitor use is reduced. To minimize noise and wilderness impacts equipment would be transported using pack stock rather than a helicopter only if new equipment is installed. If the existing equipment is moved it would require a helicopter. Hand tools could be used for cutting any trees, digging soil for tower bases, and mixing cement, but a chainsaw may be required.

Continued from Alternative 3, page 2. Minimum Requirement Analysis Worksheet. As in Alternative 2, site components would be painted wherever possible and existing trees used to screen the site from visitor's view. Installation would require approximately about four days to complete. Installation would be scheduled during September, prior to the snow accumulation season, yet when visitor use is reduced. To minimize noise and wilderness impacts, hand tools would be used for cutting any trees or digging soil for tower.

## **Appendix B – Known Endangered, Threatened, and Rare Species**

### **Rocky Mountain National Park**

**Last Revised February 2002**

Rocky Mountain National Park uses the following sources to identify endangered, threatened and rare species that must be protected if found within the proposed project site.

Agencies have a variety of ways of tracking and measuring the biological imperilment of species. The U.S. Fish and Wildlife Service (USFWS) determines if a given species needs protection under the Endangered Species Act. There are three primary categories to federal listing:

#### Federal Status Codes

**LE Federal Endangered** – Listed as endangered by the U.S. Fish and Wildlife Service. The species is in danger of extinction throughout all or a significant portion of its range. Endangered species have legal protection under federal law.

**LT Federal Threatened** – Listed as threatened by the U.S. Fish and Wildlife Service. The species is likely to become endangered within the foreseeable future. Threatened species have legal protection under federal law.

**C Federal Candidate** – The U.S. Fish and Wildlife Service is considering federal listing.

The Colorado Division of Wildlife also maintains a list of imperiled species for the state of Colorado. There are three primary categories to state listing:

#### State Status Codes

**E State Endangered** – Listed as endangered by the Colorado Division of Wildlife. The species is in danger of extirpation throughout all or a significant portion of its range within the state of Colorado. State endangered species have legal protection under Colorado Revised Statutes 33-2-105 Article 2.

**T State Threatened** – Listed as threatened by the Colorado Division of Wildlife. The species is likely to become endangered within the state of Colorado within the foreseeable future. State threatened species have legal protection under Colorado Revised Statutes 33-2-105 Article 2.

**SC State Special Concern** – Listed as species of concern by the Colorado Division of Wildlife.

The Colorado Natural Heritage Program (CNHP), based in Fort Collins manages a large database and ranking system for Colorado species. Their ranking system has two primary components – a ranking for the global status of the species (G), and a ranking for that part of the range found within the state (S). Numeric extensions are added to these on a scale of 1 (extremely rare) to 5 (common).

Natural Heritage ranks should not be interpreted as legal designations. Although most species protected under state or federal endangered species laws are extremely rare, not all rare species receive legal protection.

#### Global Rank Codes

**G1** Critically imperiled globally because of extreme rarity (5 or fewer occurrences or very few remaining individuals), or because of some factor of its biology making it especially vulnerable to extinction.

**G2** Imperiled globally because of rarity (6 to 20 occurrences), or because of other factors demonstrably making it very vulnerable to extinction throughout its range.

- G3** Vulnerable throughout its range or found locally in a restricted range (21 to 100 occurrences).
- G4** Apparently secure globally, though it might be quite rare in parts of its range, especially at the periphery.
- G5** Demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery.
- ?** Uncertainty about an assigned global rank.
- T#** Trinomial rank used for subspecies or varieties. These species are ranked on the same criteria as G1-G5.

#### State Rank Codes

- S1** Critically imperiled in state because of extreme rarity (5 or fewer occurrences, or very few remaining individuals), or because of some factor of its biology making it especially vulnerable to extirpation from the state.
- S2** Imperiled in state because of rarity (6 to 20 occurrences), or because of other factors demonstrably making it very vulnerable to extirpation from the state.
- S3** Vulnerable in the state (21 to 100 occurrences).
- S#B** Refers to the breeding season imperilment of species that are not permanent residents.
- S#N** Refers to the non-breeding season imperilment of species that are not permanent residents.
- SX** Presumed extirpated from the state.
- ?** Indicates uncertainty about an assigned state rank.

The Rocky Mountain National Park list of Endangered, Threatened, and Rare Species does not include State Ranks Codes S4 and S5 because these rankings indicate that the species is secure throughout its range.

Scientific Name	Common Name	Status		CNHP Rank	
		Federal	State	Global	State
Amphibians					
Bufo Boreas Pop1	Boreal Toad	C	E	T1	S1
<i>Rana Pipiens</i>	Northern Leopard Frog		SC	G5	S3
<i>Rana Sylvatica</i>	Wood Frog			G5	S3
Birds					
Accipiter Gentilis	Northern Goshawk			G5	S3B
<i>Aegolius Funereus</i>	Boreal Owl			G5	S2
<i>Amphispiza Belli</i>	Sage Sparrow			G5	S3B
<i>Ardea Herodias</i>	Great Blue Heron			G5	S3B
<i>Bucephala Albeola</i>	Bufflehead			G5	S1B
<i>Bucephala Islandica</i>	Barrow's Goldeneye		SC	G5	S2B
<i>Circus Cyaneus</i>	Northern Harrier			G5	S3B
Coccyzus Americanus	Yellow-billed Cuckoo	C	SC	G5T3	
Cypseloides Niger	Black Swift			G4	S3B
<i>Dendroica Pensylvanica</i>	Chestnut-Sided Warbler			G5	S2B
<i>Falco Peregrinus Anatum</i>	American Peregrine Falcon		SC	T4	S2B
<i>Grus Canadensis Tabida</i>	Greater Sandhill Crane		T	T4	S2B, S4N
<i>Haliaeetus Leucocephalus</i>	Bald Eagle	LT	T	G4	S1B, S3N
<i>Melanerpes Erythrocephalus</i>	Red-Headed Woodpecker			G5	S3B
<i>Pandion Haliaeetus</i>	Osprey			G5	S3B
<i>Setophaga Ruticilla</i>	American Redstart			G5	S1B
<i>Vireo Olivaceus</i>	Red-Eyed Vireo			G5	S3B
Fish					
<i>Catostomus Platyrhynchus</i>	Mountain Sucker		SC	G5	S2?
<i>Oncorhynchus Clarki Pleuriticus</i>	Colorado River Cutthroat		SC	T3	S3
<i>Oncorhynchus Clarki Stomias</i>	Greenback Cutthroat	LT	T	T2T3	S2S3

Scientific Name	Common Name	Status		CNHP Rank	
		Federal	State	Global	State
Mammals					
<i>Canis Lupis</i>	Gray Wolf			G4	SX
<i>Felis Lynx Canadensis</i>	Lynx	LT	E	G5	S1
<i>Gulo Gulo</i>	Wolverine	C	E	G4	S1
<i>Lutra Canadensis</i> *	Northern River Otter*		E	G5	S3S4
<i>Sorex Hoyimontanus</i>	Pygmy Shrew			T2T3	S2
<i>Sorex Nanus</i>	Dwarf Shrew			G4	S2S3
<i>Ursus Arctos</i>	Grizzly or Brown Bear			G4	SX
Invertebrates (Insects)					
Colorado Luskii	A Buckmoth			G?	S1?
<i>Erebia Theano Ethela</i>	Edward's Alpine			G4	S3
<i>Hyles Galli</i>	Galium Sphinx Moth			G?	S3?
<i>Oarisma Edwardsii</i>	Edwards's Skipperling			G4	S3
<i>Oeneis Polixenes</i>	Polixenes Arctic			G5	S3
<i>Pachysphinx Modesta</i>	Modest Sphinx Moth			G?	S3?
<i>Paratrytone Snowi</i>	Snow's Skipper			G4	S3
<i>Pyrgus Ruralis</i>	Two-Banded Skipper			G4	S3
<i>Pyrgus Xanthus</i>	Xanthus Skipper			G3G4	S3
<i>Speyeria Cybele Cybele</i>	Great Spangled Fritillary			T5	S1
<i>Speyeria Hydaspe</i>	Hydaspe Fritillary			G5	S2
<i>Speyeria Nokomis Nokomis</i>	Great Basin Silverspot Butterfly			T2	S1
<b>Mollusk</b>					
<i>Acroloxus Coloradensis</i>	Rocky Mountain Capshell		SC	G?	S2
Plants					
<i>Aletes Humilis</i>	Larimer Aletes			G2G3	S2S3
<i>Aquilegia Saximontana</i>	Rocky Mountain Columbine			G3	S3
<i>Botrychium Echo</i>	Reflected Moonwort			G2	S2
<i>Bortychium</i>	Lance-Leaved			T4	S2

Scientific Name	Common Name	Status		CNHP Rank	
		Federal	State	Global	State
<i>Lanceolatum var Lanceolatum</i>	Moonwort				
<i>Bortychium Lunaria</i>	Moonwort			G5	S2
<i>Bortychium Minganense</i>	Mingan Moonwort			G4	S1
<i>Bortychium Pallidum</i>	Pale Moonwort			G2	S2
<i>Carex Leptalea</i>	Bristle-Stalk Sedge			G5	S1
<i>Cyripedium Fasciculatum</i>	Purple's Lady's-Slipper			G4	S3
<i>Cystopteris Montana</i>	Mountain Bladder Fern			G5	S1
<i>Draba Grayana</i>	Gray's Peak Whitlow-Grass			G2	S2
<i>Drymaria Effusa var. Depressa</i>	Pinewoods Drymary			T4	S1
<i>Dryopteris Expansa</i>	Spreading Wood Fern			G5	S1
<i>Isoetes Setacea subsp. Muricata</i>	Spiny-Spored Quillwort			G5T5?	S2
<i>Juncus Tweedyi</i>	Tweedy Rush			G3	S1
<i>Juncus Vaseyi</i>	Vasey Rush			G5?	S1
<i>Liatris Ligulistylis</i>	Gay-Feather			G5?	S1S2
<i>Lilium Philadelphicum</i>	Wood Lily			G5	S3
<i>Listera Borealis</i>	Northern Twayblade			G4	S2
<i>Listera Convallarioides</i>	Broad-Leaved Twayblade			G5	S2
<i>Mimulus Gemmiparus</i>	Weber Monkey Flower			G2	S2
<i>Papaver Kluanense Occidentale</i>	Alpine Poppy			T5	S2
<i>Parnassia Kotzebuei</i>	Kotzebue Grass-of-Parnassus			G4	S2
<i>Penstemon cyathophorus</i>	Middle Park Penstemon			G3G4	S3
<i>Potentilla Effusa Var. Rupicola</i>	Rocky Mountain Cinquefoil			T2	S2
<i>Salix Serissima</i>	Autumn Willow			G4	S1
<i>Sisyrinchium Pallidum</i>	Pale Blue-Eyed Grass			G3	S2

Scientific Name	Common Name	Status		CNHP Rank	
		Federal	State	Global	State
<i>Viola Selkirkii</i>	Selkirk Violet			G5?	S1

## Appendix C - SNOTEL Site Equipment

### Alternative 2 – Relocate the Copeland Lake SNOTEL Equipment

ITEM	Weight (lbs.)	Packed Dimensions
Antenna	50	8"x8"x8"
Tower	120	3 pieces 1'x1'x10', 1 piece 1'x1'x3'
Mast	30	1'x1'x9'
Battery	80	12"x8"x16"
Cable	30	12"x3'x3'
Concrete	2400	30 bags 6"x18"x24"
Conduit, Elbows, Connectors	70	1 piece 1'x1'x10', 1 piece 1'x1'x2'
Depth Sensor Tower	80	1 piece 1'x1'x10', 1 piece 1'x1'x3'
Ground Rods	10	2 pieces 1'x1'x10'
Ground Truth Marker Poles	40	8 pieces 2"x2"x6'
Methanol/water solution	1400	3 55-gallon drums
Misc. Supplies	30	2'x2'x2'
Nema Cabinet	80	1'x2'x3'
Oil	2	3"x3"x8"
Pillow	80	4'x4'x12"
Pillow Hardware Cloth	60	2'x2'x4'
Precip. Gauge Anchor Bolts	10	4'x4"x12"
Precip. Gauge Concrete Forms	20	3'x3'x1'
Precipitation Gauge	210	1 piece 3'x3'x12', 1 piece 4'x4'x1'
Propylene Glycol	50	2'x2'x3'
Shelter Concrete Forms	20	4'x4'x1'
Shelter Materials	600	4 pieces 4'x8'x6", 1 piece 4'x4'x8", 1 piece 4'x4'x16"
Snow Depth Enclosure	20	12"x16"x8"
Snow Depth Sensor	5	3"x3"x3"
Solar Panel w/ mount	20	3'x2'x1'
Temperature Sensor	10	6"x6"x12"
Transceiver	15	6"x16"x24"
Transducers	5	6"x6"x12"
Voltage Regulator	2	6"x6"x6"
<b>TOTAL WEIGHT</b>	<b>5,549 lbs.</b>	

**Alternative 2 – Install New Equipment at the New Site****Alternative 3 – Install New Equipment at the New Site**

ITEM	Weight (lbs.)	Packed Dimensions
Antenna	50	8"x8"x8"
Tower	85	2 pieces 1'x1'x10', 1 piece 1'x1'x3'
Mast	30	1'x1'x9'
Batteries	160	24"x8"x16"
Cable	30	12"x3'x3'
Concrete	800	10 bags 6"x18"x24"
Conduit, Elbows, Connectors	70	1 piece 1'x1'x10', 1 piece 1'x1'x2'
Ground Rods	10	2 pieces 1"x1"x10'
Misc. Supplies	30	2'x2'x2'
Nema Cabinet	80	1'x2'x3'
Snow Depth Enclosure	20	12"x16"x8"
Snow Depth Sensor	5	3"x3"x3"
Solar Panel w/ mount	20	3'x2'x1'
Temperature Sensor	10	6"x6"x12"
Transceiver	15	6"x16"x24"
Voltage Regulator	2	6"x6"x6"
Gamma Sensors	50	10"x10"x30"
<b>TOTAL WEIGHT</b>	<b>1,467 lbs.</b>	

## **Appendix D - Cultural Resources Documentation**

Survey of SNOTEL Monitoring Site Near Ouzel Falls, Rocky Mountain Park, Boulder County, Colorado

### **Description of undertaking/project**

Installation of USDA National Resources Conservation Service (NRCS) SNOTEL for monitoring snow. The SNOTEL consists of a building (4 x 4 x 8 feet high), Precipitation gauge (2 x 2 feet), and snow measurement “pillows” (10 x 10 foot) to measure snow fall and precipitation. The 30-foot antenna on top of the structure is used to automatically send precipitation data to a satellite or radio receiver for transmittal to the NRCS. The report submitted was entitled “Limited Results: Cultural Resource Survey of the Proposed SnoTel Snow Monitoring Site Near Ouzel Falls, Rocky Mountain National Park, Boulder County, Colorado,” and numbered ROMO C-00-14.

### **Nature of Anticipated Disturbance**

The proposed location for the SNOTEL is in the Wild Basin area of the Park about 2,000 feet west of Ouzel Falls, and about 100 feet south of the trail to Thunder Lake.

### **Survey Method**

William B. Butler, Ph.D., Park Archeologist surveyed a bench on the north-facing slope of a ridge between Ouzel Creek and the North St. Vrain River on July 26, 2000. The proposed location for the monitoring station, a ca. 50 by 50-foot area, was pedestrian surveyed. In addition, an area over an acre in size was surveyed to ensure that alternate areas are available for the station should any resources be found in the desired location. Total number of acres surveyed is ca 1.0.

### **Statement of Objectives**

The objective of the survey was to locate, record, and evaluate cultural resources for compliance with the National Historic Preservation Act of 1966, as amended. Information on the location, size, time period, cultural affiliation, integrity, and National Register of Historic Places criteria is to be used by the Park for the necessary cultural resource compliance actions as well as contributing to an understanding of the history and prehistory of the Park.

### **Field Methods**

Ten or more items including features, in a 100 square meter area reflecting two or more functions are considered a site. Less than ten items in a 100 square meter area or a single feature without other artifacts are considered an isolated find.

### **Results of the Survey**

The only cultural resource found in the project area was a single hearth about 75 x 55 cm in size. The hearth consisted of two courses of granite cobbles about 10 - 15 cm in size. As the cobbles are not buried, are only lightly covered with lichen, and with the hearth containing a partially

burned log and decomposing charcoal, a fairly recent date is suggested. No artifacts were found in the area. The hearth is located about 100 feet south of the trail to Thunder Lake.

The hearth was recorded as isolated find Smithsonian number 5BL.8668. The location is PM 6<sup>th</sup>, Township 3 North Range 73 West Unplatted sections; UTM: 448430mN/4450079mE in the center of a one acre survey area.

### **Literature Review**

Location of the File Search is RMNP Cultural Sites Inventory on July 24, 2000. No previous activity is in the project area. In general, Brunswig (2000) surveyed a large area about a quarter of a mile to the east of the project area as part of the park-wide SAIP survey. No known cultural resources are in the project area or in the general region within about a two-mile radius of the project area. No sites were expected given the location of the proposed monitoring site on a bench well above any permanent water and in a dense pine forest.

### **References**

Brunswig, Robert H., Jr.

*2000 Report on 1999 Archaeological Surveys in Rocky Mountain National Park by the University of Northern Colorado.* Report on file Rocky Mountain National Park and Midwest Archeological Center, Lincoln.